The Effect of Supply Chain Integration on Sustainable Development of Jordanian Phosphate Fertilizers Manufacturing Companies

أثر تكامل سلسلة التوريد على التنمية المستدامة لشركات صناعة الأسمدة الفوسفاتية الأردنية

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Authorization

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Examination Committee's Decision

This thesis of the student Mahmoud Nabil Shukri Nazzal, which studied **"The Effect of Supply Chain Integration on Sustainable Development of Jordanian Phosphate Fertilizers Manufacturing Companies"**, has been defined, accepted and approved on 24/5 /2016.

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"Praise be to Allah, Creator of the worlds; Creator of the Slate and Pen; made the creators from nil; managed with judicious the provisions and lifetimes; and decorated the dark night with stars"

It gives an honor to present my innovative advisor Dr. Abdel-Aziz Sharabati deep thankfulness and gratefulness due to his priceless guidance, support, and advice until completed this work.

Also, I would like say thank you to all those who without their support this thesis could not be finished, namely faculties at Middle East University, companies and other people.

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Mahmoud Nabil Nazzal

Dedication

First and foremost, I gratefully thank my Lord Allah for empowering me with plenty health and strength to achieve this work.

To my mother's peaceful spirit, this thesis is presented; with prayers to Allah bless her soul with mercies and dwell it in his broadened paradise". To my father I pray for him an extended life and to my dear brothers; Mohammed and Mutaz.

Also, I would like to present this thesis to my little family: my dear wife and my sons for their time, help and patience without which this work could not be accomplished.

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The Effect of Supply Chain Integration on Sustainable Development of Jordanian Phosphate Fertilizers Manufacturing Companies

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Abstract

This study aimed at investigating "The Effect of Supply Chain Integration on Sustainable Development of Jordanian Phosphate Fertilizers Manufacturing Companies". In order to achieve the objective of this study, the data were collected through questionnaire from (102) managers working at the targeted companies. The collected data were coded against Statistical Package for Social Sciences (SPSS). After confirming normality, validity and reliability of the questionnaire, a descriptive statistical analysis was carried out, the correlation, and single, multiple regressions were used to test the hypotheses. The results of the current study shows that the Jordanian Phosphate Fertilizers Manufacturing Companies implement SCI variables, where customer integration has rated the highest, followed by internal processes integration and finally supplier integration, and they implement SD dimensions, where economic responsibility has rated the highest, followed by social responsibility and finally environmental responsibility. The results also show that there are strong relationships among SCI variables and there are strong relationships among SD dimensions. The relationships of each SCI variable with total SD are also strong and finally, the relationship between SCI and SD is strong too.

Finally, there is a high significant effect for internal processes integration on sustainable development, while there are no significant effects for supplier and customer integration on sustainable development. The current study recommends the companies to rethinking in recycles its industrial waste of gypsum, because of its negative impact on the environment.

Key words: Supply Chain Integration (SCI), Supplier Integration (SI), Internal Integration (II), Customer Integration (CI), Sustainable Development (SD) and Jordanian Phosphate Fertilizers Manufacturing Companies.

أثر تكامل سلسلة التوريد على التنمية المستدامة لشركات صناعة الأسمدة الفوسفاتية الأردنية

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الدكتور عبدالعزيز الشرباتي

الملخص

هدفت هذه الدراسة إلى بحث أثر تكامل سلسلة التوريد على التنمية المستدامة لشركات صناعة الأسمدة الفوسفاتية الأردنية.

ولتحقيق أهداف الدراسة، قام الباحث بجمع المعلومات الأولية من عينة الدراسة من خلال (102) إستبانة من المديرين العاملين فى الشركات المستهدفة. تم استخدام برنامج الحزم الإحصائية للعلوم الاجتماعية (SPSS) للتحليل الإحصائي. كما إستخدمت الدراسة عددا من الأساليب الإحصائية مثل الإحصاء الوصفي، تحليل الإرتباط وتحليل الإنحدار البسيط والمتعدد لفحص الفرضيات.

وبعد إجراء عملية التحليل لبيانات الدارسة وفرضياتها توصلت الدارسة إلى عدد من النتائج أبرزها:

تقوم شركات صناعة الأسمدة الفوسفاتية الأردنية بتطبيق تكامل سلسلة التوريد حيث أن التكامل مع الزبائن كان في المرتبة الأولى، يليه التكامل الداخلي للعمليات فى المرتبة الثانية وأخيرا كان التكامل مع الموردين فى المرتبة الثالثة. كما أن الشركات أعلاه تقوم بتطبيق أبعاد التنمية المستدامة حيث أن المسؤولية الإقتصادية كانت في المرتبة الأولى، تلتها المسؤولية الإجتماعية فى المرتبة الثانية وأخيرا كانت المسؤولية البيئية فى المرتبة الثالثة.

وأشارت النتائج أيضا إلى وجود علاقة قوية بين تكامل متغيرات سلسلة التوريد الثلاثة مع أبعاد التنمية المستدامة الثلاثة. كما أن هناك علاقة قوية جمعت بين التنمية المستدامة مع كل من تكامل سلسلة التوريد. وأخيرا كانت هناك علاقة قوية بين تكامل سلسلة التوريد مع التنمية المستدامة.

وأخيرا، أشارت الدراسة بوجود أثر معنوي للتكامل الداخلي للعمليات على التنمية المستدامة، بينما لا يوجد هناك أثر معنوي للتكامل مع الزبائن والتكامل مع الموردين على التنمية المستدامة.

وتوصي الدراسة الشركات المستهدفة إلى إعادة النظر في تدوير النفايات الصناعية من الجبس، نظرا لتأثيرها السلبي على البيئة.

الكلمات ذات الدلالة: تكامل سلسلة التوريد، التكامل مع الموردين، التكامل الداخلي، التكامل مع الزبائن، التنمية المستدامة، شركات صناعة الأسمدة الفوسفاتية الأردنية.

Chapter One:
Introduction

1.1. Background:

Globalization and its impact on the open markets and whilst the competition are increasing and became at the international and regional level, which made companies to introduce a better goods and services at suitable price in the right place and specific time. For that it was necessary for these companies develop its relations with suppliers and customers. Supply Chain Integration SCI is coordinated collaboration between the organization internal departments and its partners of suppliers and customers depending on an effective management of incoming material, services, information and money. This process will add extra value to product by delivering cost-effective quality product to final consumers timely.

Devaraj, et. al. (2007:1199) proclaimed that e- business technologies support customer and supplier integration in the supply chain, which it impact operating performance. Mishra and Shekhar (2011:2) said that supply chain in any industry consists from many stakeholders, so supply chain is an opportunity. Yildiz and Yercan (2011:13) mentioned that the capability to discover the overall organizational performance on environmentally specific tasks can be limited if the organization strategy condone the opportunities presented by core processes design. Torabizadeh, et. al. (2012:940) stated that SCM strategy should assist and drive forward business strategy, In order to fulfill competitive advantage and better performance of an organization. Mohan and Rigin (2013:95) stated that there are global competitions. The product's introduction with shorter life cycles and the customers' expectations have forced organizations to invest and focus attention on, their supply chains. Shiraz and Ramezani (2014:1) said that complications of goods and services in these days indicator to the organization that can't stay alone and without the

assistance with other organizations, led to the formation of supply chains. Mohd-Jamal and Tayles (2014:50) claimed that changes of the organizational outlines by supply chain management, led to the success in the establishment of long term collaborations along the supply chain, has an impact on competitive advantage and profitability. Byun, et. al. (2015:7) declared that successful and efficient management of supply chain requires integration of processes internally within an organization and externally across suppliers and customers.

Sustainable Development SD, which promotes economic prosperity, increased social welfare and environmental protection - provide the best ways to improve the lives of people everywhere. So it is imperative to companies to cooperate in solving the environmental, social and economic problems. Labuschagne, et. al. (2003:1) stated that sustainable development (the social justice, the competency of economy and environmental performance) must be integrated within the objectives of a company's operational practices. Nowosielski, et. al. (2007:530) declared that "The minimization of waste and emissions and reductions in material and energy inputs are the most important environmental aims". Sawant and Thakker (2014:61) stated that for any organization, it is necessary to integrate the supply chain elements to achieve the sustainable development. This means rethinking business patterns as well as products, technologies and processes.

Therefore, the current study tried to investigate the role of supply chain integration in the Jordanian Phosphate Fertilizers Manufacturing Companies, and its effect on the sustainable development, because of their importance for Jordan as well as because of their impact on society, economic and the environment.

1.2. Problem Statement:

For more than twenty years of researcher experience with Phosphate fertilizers industry in Jordan, and by conducted interviews with managers who reported the following concerns and difficulties as problems encountering the industry: the raw materials provided by the supplier no longer meet the quality standards as agreed upon, the information is being only shared among managers via the IT facilities, disinterest with recycling industrial waste and delay of raw-materials delivery from supplier to the companies. Zailani and Rajagopal (2005: 390) recommended that companies must develop network of information to reinforce the relationships of the integration to linkage the customers and suppliers with the internal practices of the company's activities. Shiraz and Ramezani (2014:6) recommended that companies must enhance the suppliers relationships by recognize their requirement, set up instructions, inform them about the companies policies and their information sharing must be exact, complete, reliable and on time. Hamri, et. al. (2014:79) recommended the companies must develop tools for managing the supply chain to achieve costs reduction, while producing a quality and safety products. Mose, (2015:3) recommended that the industry managers must reinforce the three elements of supply chain.

Based on the discussion above, it sure to study the topic of supply chain integration; therefore the main purpose of this research is to answer the following main questions:

1. Do sustainable development affect supply chain integration of Jordanian Phosphate Fertilizers Manufacturing Companies?
2. Does supply chain integration affect sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies?

Based on supply chain integration the main question can be divided into the following sub-questions:

2.1. Does suppliers' integration affect sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies?

2.2. Does internal processes' integration affect sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies?

2.3. Does customers' integration affect sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies?

1.3. Study Purpose and Objectives:

The Research Purpose:

Provide sound recommendations to Jordanian Phosphate Fertilizers Manufacturing Companies and other companies.

The Research Objectives:

1- Investigating the effect of the supplier integration in supply chain management on the sustainable development in the Jordanian Phosphate Fertilizers Manufacturing Companies.

2- Investigating the effect of the internal processes integration in supply chain management on the sustainable development in the Jordanian Phosphate Fertilizers Manufacturing Companies.

3- Investigating the effect of the customer integration in supply chain management on the sustainable development in the Jordanian Phosphate Fertilizers Manufacturing Companies.

1.4. Study Importance:

Theoretical Importance: The importance of this study is to enhance its contribution in the existing researches examined the effect of Supply Chain Integration on Sustainable Development, in another study population.

Practical (Applied) Importance: The results of this study will provide sufficient data to managers who are working in the Phosphate Fertilizer Manufacturing Companies that give them supportive guidance to manage the Supply Chain Integration to achieve Sustainable Development (SD).

1.5. Study Hypotheses:

The following hypotheses can be derived from the mentioned above questions.

The main Hypotheses:

H_{01}: The sustainable development does not have effect on supply chain integration of Jordanian Phosphate Fertilizers Manufacturing Companies, at ($\alpha \leq 0.05$).

H_{02}: The supply chain integration does not have effect on sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies, at ($\alpha \leq 0.05$).

Based on supply chain integration the main hypothesis can be divided into the following sub-hypotheses:

$H_{02.1}$: Suppliers' integration does not have effect on sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies, at ($\alpha \leq 0.05$).

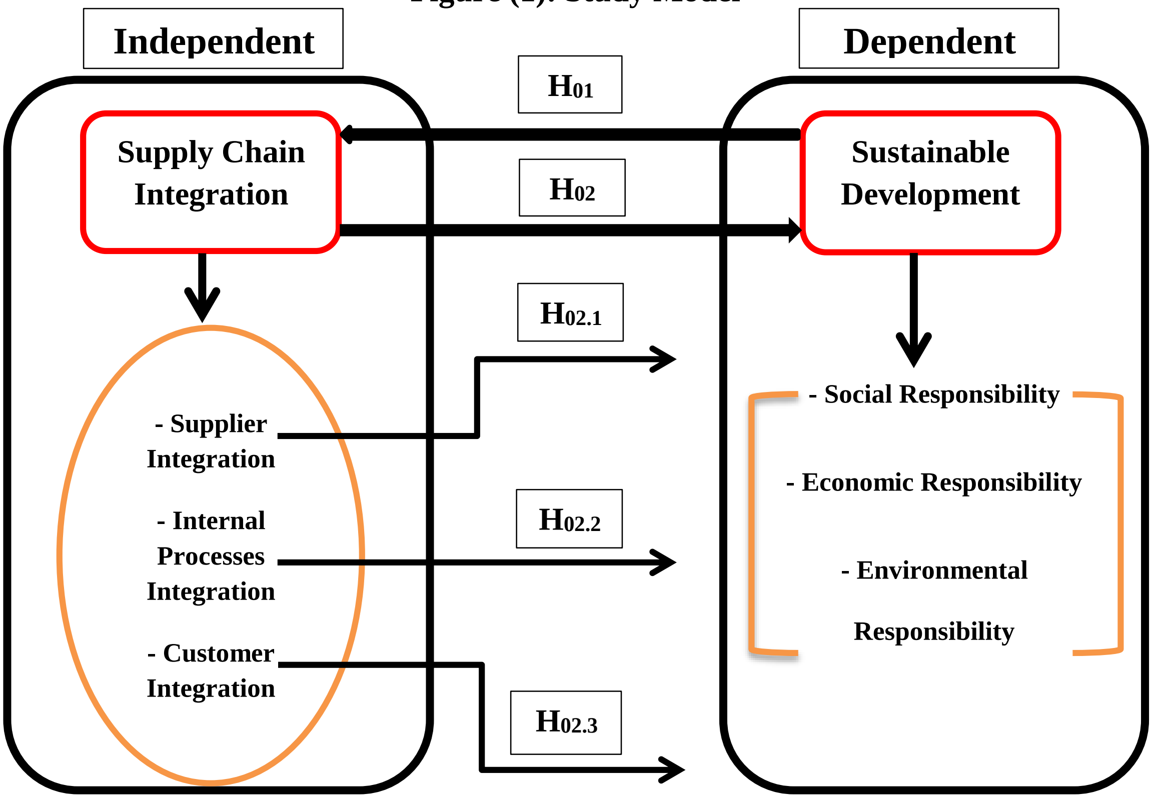
$H_{02.2}$: Internal processes' integration does not have effect on sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies, at ($\alpha \leq 0.05$).

$H_{02.3}$: Customers' integration does not have effect on sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies, at ($\alpha \leq 0.05$).

1.6. Study Model:

Based on problem statement, the following model has been developed to illustrate the effect of supply chain integration on sustainable development, as shown in model (1).

Figure (1): Study Model



The model has been clearly based on previous studies such as:
Source: Frohlich and westbrook (2001:186), Sebastian J, et. al. (2001:14), Huo (2012, Tolossa, et. al. (2013), Rostamzadeh, et. al. (2015:186), Mose, (2015:17), Sultan El-Tamimi (2015)

1.7. Procedural (Operational) Definitions:

In this study, the following procedural definitions will be used:

1- Supply Chain Integration: The coordinated collaboration between the organization and its partners of suppliers and customers depending on an effective management of incoming material, services, information and money. This process will add extra value to product by delivering cost-effective quality product to final consumers timely.

2- Sustainable Development: The best use of available natural resources, conservation within the right of future generations to those resources and environmental conservation.

3- Supplier Integration: Cooperation process among supplier and organization by sharing information and knowledge, providing a high quality raw material on time.

4- Internal Processes Integration: The set of activities and tasks which are implemented within each department by a collaborator member to accomplish the organization's objectives.

5- Customer Integration: The process of building a long-term relationship between the customer and the organization which build on mutual trust and the ability to meet customers' needs.

6- Social Responsibility: The organization's commitment to participate in the different social activities to achieve an accepted level of social well-being.

7- Economic Responsibility: A continuous ability process to support the local economic growth.

8- Environmental Responsibility: The process that aims to reducing the environmental burden and resources conserving.

1.8. Study Limitations:

Human Limitations: The study targets different categories of managers who are working in the Jordanian Phosphate Fertilizers Manufacturing Companies.

Location Limitations: (JIFCO, JPMC and IJC) in Eshidiya mine, Al Aqaba, and Amman, all located in Jordan.

Time Limitations: This study will be carried within the period between the first semester and the second semester of academic year 2015/2016.

1.9. Study Delimitations:

This study examined the effect of supply chain integration on sustainable development at Phosphate Fertilizers Manufacturing Companies in Jordan. Generalizing Jordanian setting on other countries is questionable. This study is limited on industry therefore; the study recommends investigating the effect on other industries.

Chapter Two:
Literature Review and Previous Studies

This chapter includes conceptual and theoretical framework, previous studies, relationship between variables and the contribution of the current study compared to previous studies.

2.1. Conceptual and Theoretical Framework:

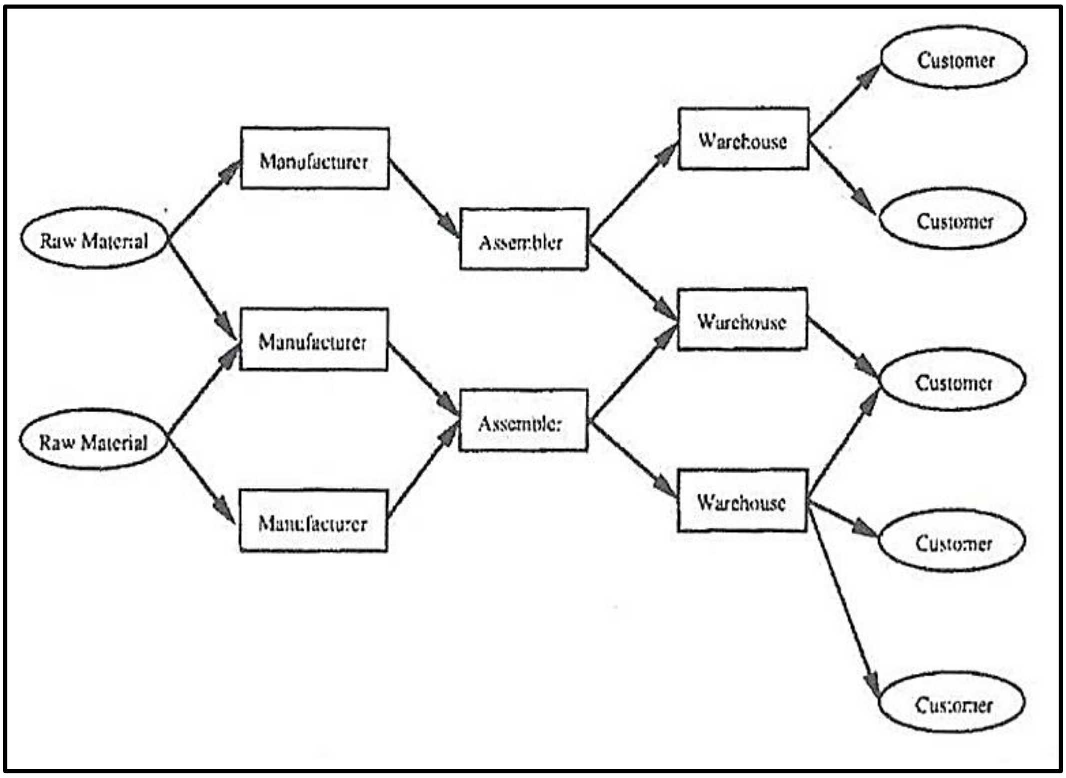
This section includes the basic concepts and definitions of the supply chain integration and sustainable development.

2.2. Supply Chain Concept:

The supply chain can be viewed as a partnership among various organizations, activities, information, resources and individuals, where the raw materials are channeled by the supplier to operations and internal activity units of the organization to process them into final product and supply the product to consumers while creating added-value and continual improvement of the product.

As shown in (Fig. 2). Thomas and Griffin (1996) stated that there are three major stages in supply chain, procurement, production and distribution, and each of it had independent management. They illustrated in their model the components of supply chain.

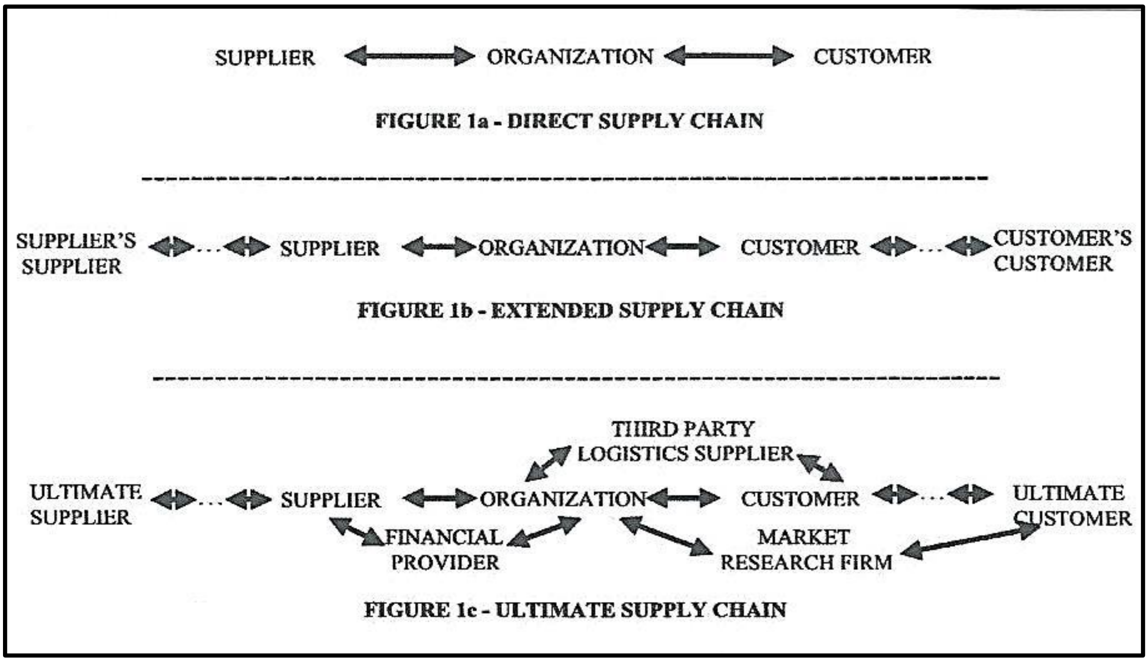
Figure (2): Coordinated Supply Chain Management



Source: Thomas and Griffin (1996)

Mentze, et. al. (2001) defined supply chain as three degrees. First: direct supply chain which consists of a company, a supplier, and a customer included in the upstream and/or downstream flows of services, products, finances, and/or information (Fig.3. 1a). Second: An extended supply chain involved suppliers of the immediate supplier and customers of the immediate customer, all included in the upstream and/or downstream flows of services, products, finances, and/or information (Fig. 3. 1b). Third: An ultimate supply chain involves all the organizations included in all the upstream and downstream flows of products, services, finances, and information from the ultimate supplier to the ultimate customer (Fig. 3. 1c).

Figure (3): Defining Supply Chain Management



Source: Mentze, et. al. (2001)

Trkman and Groznik (2006) defined supply chain as "a linked set of resources and processes that begins with the sourcing of raw materials and extends through the delivery of end items to the final customer". Naslund and Williamson (2010) mentioned that supply chain consists of upstream network of suppliers and downstream network of customers, within a systematic information flow cross those networks. Mose (2015) noted that supply chain as network of companies that are engaged, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of ultimate consumer.

Based on earlier arguments and definitions of the supply chain, study concludes that the supply chain is a significant part in the operation of different organizations. Hence, the supply chain is a system of sequenced functions that operate harmoniously to achieve the customer satisfaction and would operate ineffectively if any of the functions disrupted.

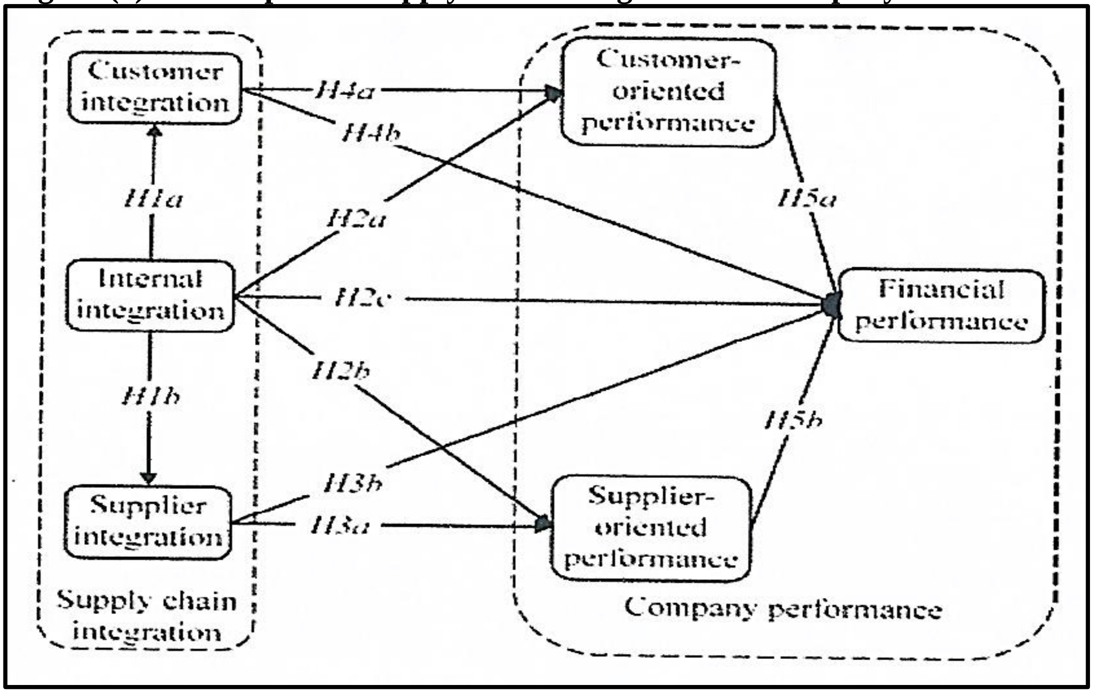
2.3. Supply Chain Integration Concept:

Supply chain management is viewed as the hub for the integration of the supply chain elements. Specifically, the more integrated become the organization (internal processes) and suppliers (external processes), from a hand, and customers (external integration), from another, the more positive effects will reflect not only on the organization but also on its suppliers and customers as a result of its various activities. Thomas and Griffin (1996:1) stated that competition increased in the world wide; drive the firms to activate coordination between supply chain elements to achieve the cost reduction. Frohlich and Westbrook (2001:189) said that stage to which a firm could strategically collaborate with its supply chain partners and cooperatively manage intra- and inter-organizational processes to achieve effective and efficient flows of products, services, information, money, and decisions to provide the maximum value to the final customer with low costs and high speed. Horvath (2001) proclaimed supply chain integration was the key to creating value in supply chain management.

Zailani and rajagopal (2005:380) said that supply chain integration a set of practices aimed to place coordination within the supply chain from raw material suppliers to the final user- customer to gain win-win situation. Power (2005:254) noted the organization's strategy that not include the effective of supply chain integration, it will effect on the parties involved. Trkman and Groznik (2006:37) claimed that coordination of any supply chain components is vital for the success of each chain. Li, et. al. (2006:107) mentioned that supply chain management challenges is produce a product to the right place at the right time at the lowest cost. Awad and Nassar (2010:2) declared firms must manage and control the integration of business, technology, people, and processes not only within the firm but with business partners. As shown by Fig. (4), the integrated supply chain elements have a significant impact on the organization performance. The internal integration

improves performance of the organization as a whole by increasing the external integration (customer integration-supplier integration), (Huo, 2012:598).

Figure (4): The Impact of Supply Chain Integration on Company Performance

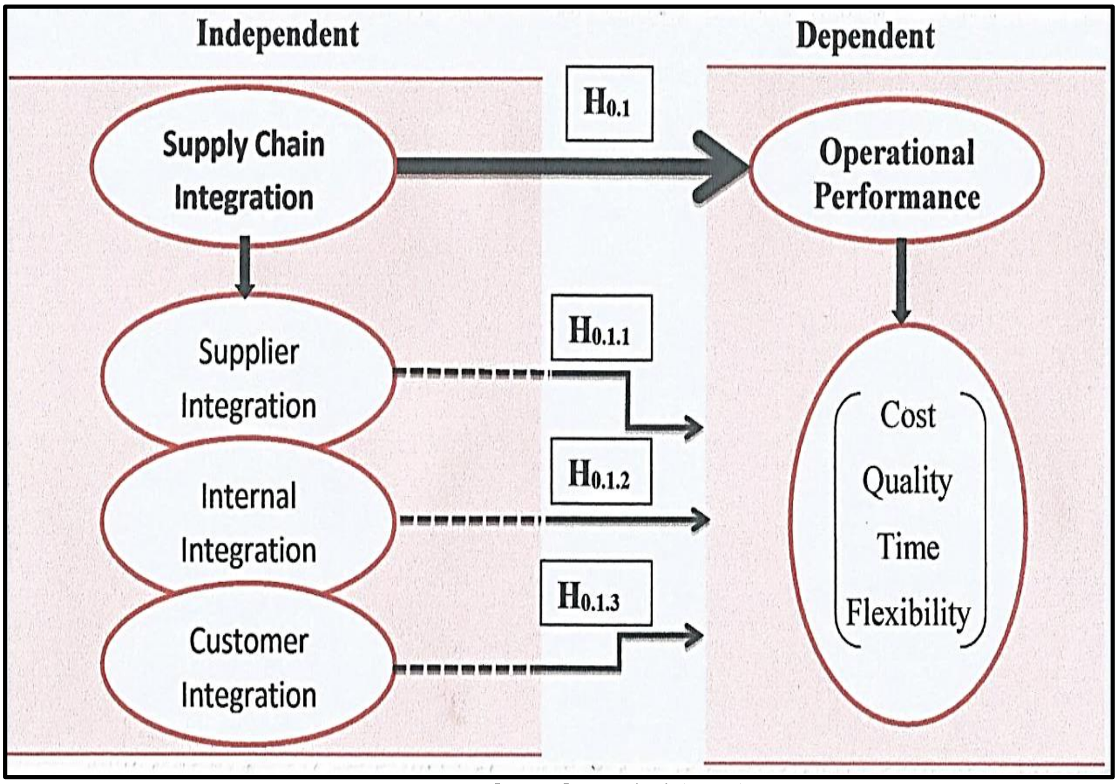


Source: Huo (2012)

Tolossa, et. al. (2013:164) stated there is no self-sufficient for any firm in the industrial age without cooperation with other firms. Byun, et. al. (2015:2) defined supply chain integration as an integration process across organization and suppliers, customers based on long term collaborative relationship. Mose (2015:13) announced as a competition continually is increasing, organizations should not only concentrate to improve their internal operations, but also focus on the integration of suppliers and customers in the entire processes of chain.

Sultan El-Tamimi (2015) reported a positive effect of the integrated supply chain elements (supplier, internal processes, and customer) on the operating performance components (cost, quality, time, and flexibility); (Fig. 5) illustrates the effective positive relationship indicated by El-Tamimi (2015).

Figure (5): The Impact of Supply Chain Integration on Operational Performance



Source: Sultan El-Tamimi (2015)

To summarize, based on the related literature reviewed, the supply chain integration can be defined as the coordinated collaboration between the organization with its partners of suppliers and customers depending on an effective management of incoming material, services, information and money. This process will add extra value to product by delivering cost-effective quality product to final consumers timely.

2.4. Supply Chain Integration Variables:

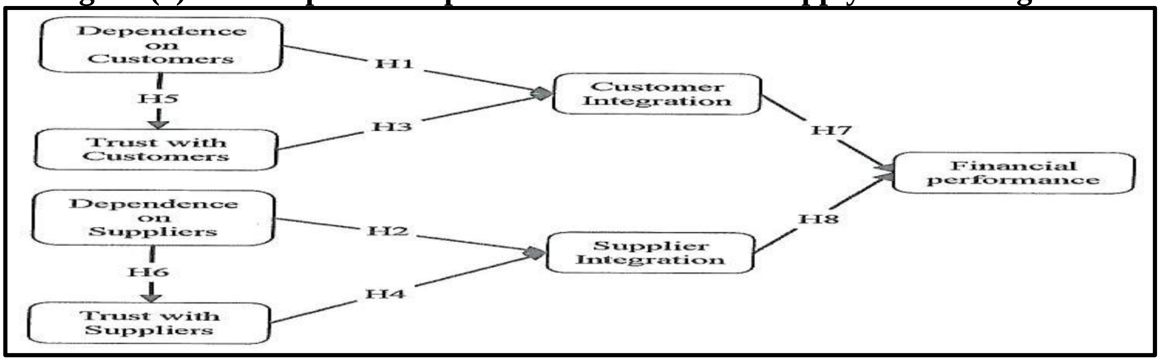
Essentially, the supply chain includes three variables (supplier, internal processes, and customer). Some authors conceptualized the supply chain as elements of internal and external integrations. Chen and Paulraj (2004) defined internal processes integration as different departments within a firm do not doing as functional silos but as part of an integrated process. Swink, et. al. (2007) defined external integration as a process of cooperation and collaboration with customers and suppliers through various activities, such as strategic alliance, information sharing, communication, process coordination, joint

product development, and working together. Also Mose (2015:2) declared that supply chain elements divided into two categories. Internal supply chain process involves multiple functions within companies; external supply chain involves supplier and customer.

Some authors argued that the organization-supplier and organization-customer relationships shall be based on mutual trust. The effectiveness of that relationship is measured by the organization's performance in that the stronger relationship, the higher organization's performance will be.

Ireland and Webb (2007) stated Trust in supply chain relationships influence integration in different ways. Yeung, et. al. (2009) proclaimed that trust is critical for relieving exchange risk and the level of cooperation among supply chain partners because it reduces the uncertainty of partner's' actions and opportunism. As shown in the (Fig. 6) trust with customers/suppliers influenced on supply chain integration. Although dependence on customers/suppliers has no direct effect on supply chain integration, it improves supply chain integration indirectly through trust with customers/suppliers (Zhang and Huo, 2012).

Figure (6): The Impact of Dependence and Trust on Supply Chain Integration

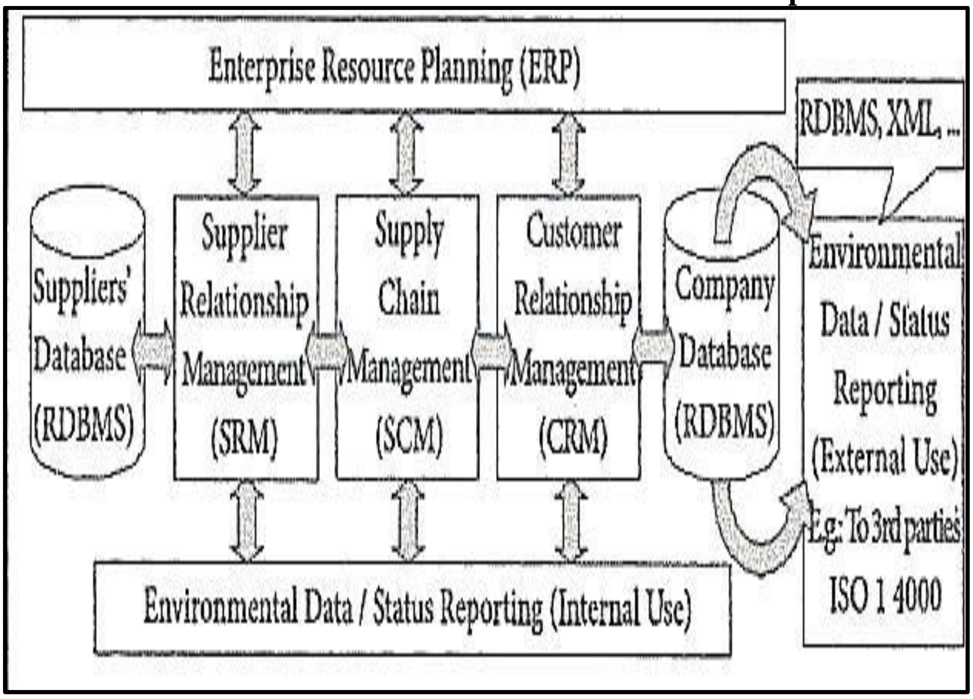


Source: Zhang and Huo (2012)

While the supply chain defined as a flow of information, products and money between the initial suppliers and final customers through different organizations. Nurmilaakso

(2008) mentioned that supply chain integration, which is a key dimension of supply chain management, includes information sharing within supply chain members. Datta et. al. (2007) proclaimed that effective integration within organization internal business processes led to increase supply chain overall operational performance. So the better information and data sharing among the supply chain stakeholders; Sahin, et. al. (2002) said “often considered as a generic cure for supply chain ailments”. Furthermore; Yildiz and Yercan (2011) indicated that information exchange systems and the need for step-by-step control of business processes have established; for fully integrated business functions management that at the same time allows companies to have connections with the external sources as shown in (Fig. 7).

Figure (7): Environmental Reporting Of Industrial and Supply Chain Business Processes within the Context of Sustainable Development



Source: Yildiz and Yercan (2011)

Lee (2000) recognized three dimensions of supply chain integration:

- Information integration, which is the sharing of information. (e.g., demand information, production schedules) and knowledge between supply chain partners.
- Coordination, which cover the reorganization of decision rights (e.g., replenishment decisions).
- Organizational relationship linkages, which involve the maintaining of communication channels.

From the earlier discussion it is clearly demonstrated that IT integration in the supply chain is necessary and vital for creating integration elements, of the supply chain in the form of integration of incoming material and incoming data. Finally; Vlachos, et. al. (2008:269) mentioned that an integration between all supply chain elements were a vital issue for the effective management of all the supply chain internally and externally.

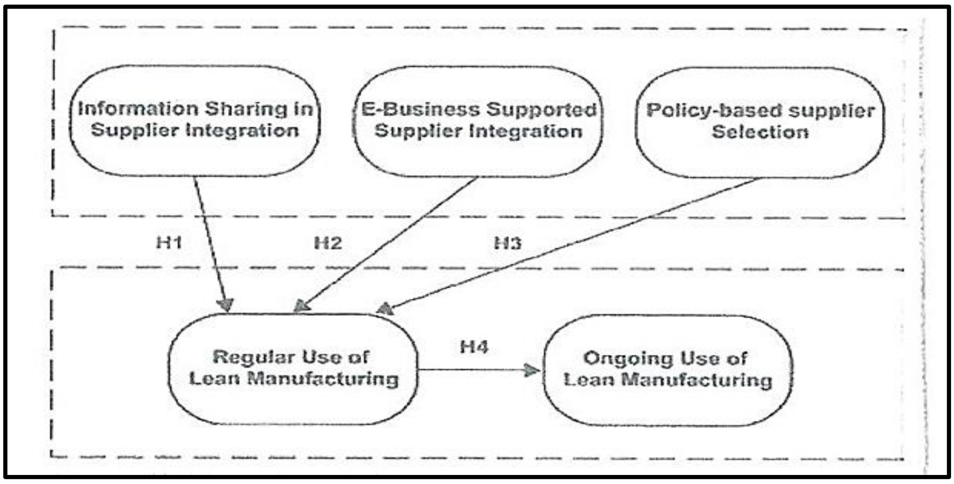
Therefore, it should to examine supply chain elements which it consist of three major elements; supplier integration, internal processes integration and customer integration. Current study analyzed each of those elements, according to the importance of integration with the supply chain.

2.4.1. Supplier Integration Concept:

Many studies addressed the significant issue of supplier integration with the organization as it signals a long-term relationship that has the potential to reduce cost in the supply chain. Some studies stressed on interchanging accurate and quality data, while others were focused on the nature of the relationship and mutual trust due to influence on the performance. The selection process of a supplier was emphasized by other studies that advised to be dealt with carefully.

Spekman, et. al. (1998:648) mentioned must prevail long-term of cooperation and coordination relationships between the supplier and the company, the selection process of supplier is a different level of commitment and trust. Lee, et. al. (2000:631) emphasized that the excellence of relationships among partners reinforce material flow within the supply chain. Frohlich and westbrook (2001:196) said there are more ways which enhance forward the supplier integration in the supply chain, and can increase the cooperation and coordination between the all parties such as Internet to make sharing of information easier, support the relationships effectively. Li, et. al. (2006:107) stated the strength of relationships between the supplier and supply chain management lead to raise the organizational performance positively. Flynn, et. al. (2010:61) declared supply chain integration, a method to develop a strong relationship with supplier which can facilitate the manufacturer's need and in order to meet its changing requirements. So and Sun (2010:477) demonstrated that supplier integration efficiency is positively influenced by applying IT integration to communicate with the organization through data interchange process, and also influenced by the supplier selection policy of the organization by using L.M. strategy as shown by (Fig. 8).

Figure (8): Supplier Integration Strategy for Lean Manufacturing Adoption in Electronic-Enabled Supply Chains



Source: So and Sun (2010)

Ding H (2011:73) proclaimed that information sharing contributed in reducing supply chain costs. Zhao, et. al. (2011:18) defined supplier integration as a collaboration and coordination process among an organization and its suppliers to ensure an effective flow of supplies. Khan, et. al. (2015:21) suggested that basic rule of business success and supply chain management is emerging new competitive strategy in incorporating cooperative relationship with its suppliers. Narayanan, et. al. (2015:145) stated that the effect of collaboration on performance in supplier relationships can be positive, negative or neutral depending on the levels of trust.

In summary, supplier integration defines as cooperation process among supplier and organization by sharing information and knowledge, providing a high quality raw material on time.

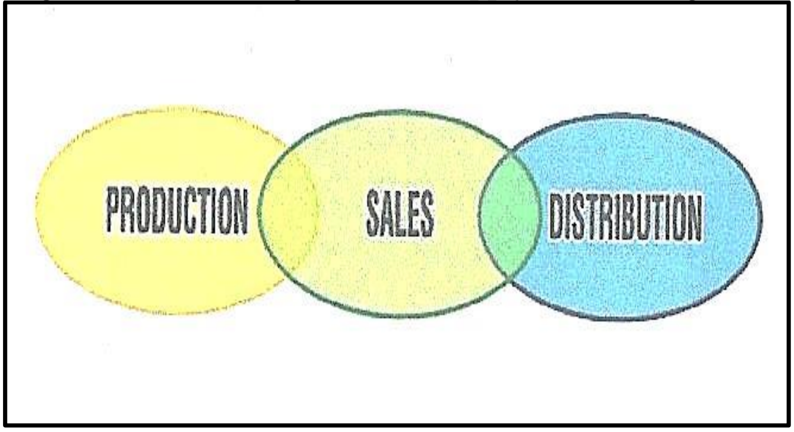
2.4.2. Internal Processes Integration Concept:

Internal processes integration is essential for success of any organization. The collaboration and coordination among the internal departments strongly reflects how effective is the interaction with supplier from a hand, and with the customer from the other. Therefore, how to bring about effective internal processes integration in the organization has recently attracted much of the interest of authors.

Basnet (1997:1) claimed that internal processes consist from different functions within the organization, the appropriate integration of those functions lead to serve the customer and enhance to increase the organizations' performance. Sebastian J, et. al. (2001:32) stated that supply chain management can implement their processes easily if they have an effective integration with each other. Flynn, et. al., (2010:59) defined internal integration as a process of interaction, collaboration, coordination, communication and cooperation within internal activities. Basnet and Wisner (2012:28) stated that internal integration

refers to the chain of value-creating activities as shown in (Fig. 9) within the company to provide a product or service to the customer.

Figure (9): Nurturing Internal Supply Chain Integration



Source: Basnet and Wisner (2012)

Roh, et. al. (2013:198) said to increase the long-term profitability; organizations must focus heavily to improve the production planning efficiency and logistics processes. Mose (2015:25) declared that the increasing of integration among the internal functions lead to positively reinforcing in the manufacturing processes.

Most studies on the internal processes integration reported a relationship between internal integration and its influence on the performance of the organization.

Ellinger (2000:92) proclaimed that reward system and the departmental internal relations influenced positively on the organization's performance. Chen, et. al. (2007:7) mentioned that logistics collaborative activities lead to firm-wide integration, which leads to performance.

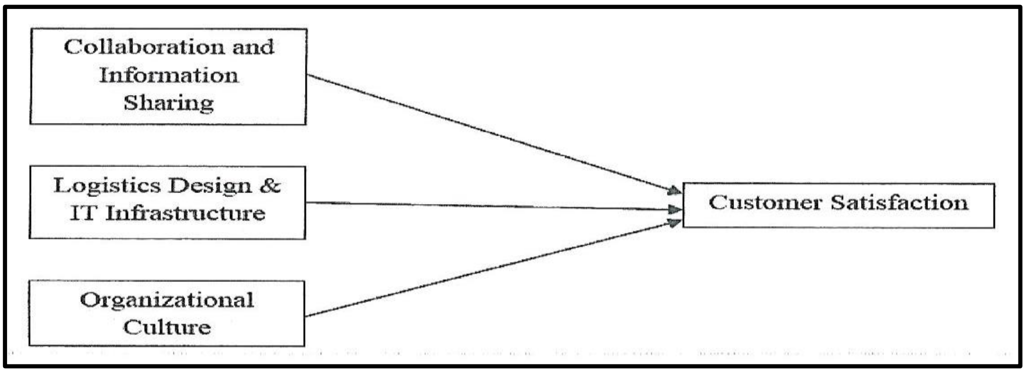
Therefore; internal processes integration defines as the set of activities and tasks which are implemented within each department by a collaborator member to accomplish the organization's objectives.

2.4.3. Customer Integration Concept:

The organization-customer relationship is established on mutual trust, cooperation and coordination and is supported by improvement of product quality, responsiveness, and IT and Communication technologies. Customer integration, therefore, is a focal point to exercise influence on the performance of the supply chain as a whole.

Koufteros, et. al. (2005:104) proclaimed that customer integration definition is the range to which customers and companies coordinate decisions related to inventory level, production planning, demand forecasting, order tracking, and products delivery. Flynn, et. al. (2010:60) said the solid relationships among an organization and customers are offering opportunities for improving the information accuracy, which reduces the time of product design, and production planning time. Zhao, et. al. (2011:18) defined customer integration as a coordination, collaboration process among an organization and its customers to ensure flow of products effectively. As shown in the (Fig. 10), Haque and Islam (2013:125) investigated that there was three dimensions should to be integrated with the customer, such as collaboration and information sharing, logistics design and IT infrastructure, and organizational culture to achieve the customer satisfaction.

Figure (10): Effects of Supply Chain Management Practices on Customer Satisfaction



Haque and Islam (2013) Model

Beheshti, et. al. (2014:21) claimed that an effective customer integration, by the supply chain management that enhances the advanced technology with the customers. Huo, et. al. (2014:378) declared that customers should integrate with internal company's processes. Mose, (2015:25) stated a connection process between an organization and customers through information networks and computerization of the services led for ease communication. Saha, et. al. (2015:445) mentioned that cooperation among supply chain elements is important for improving its performance, by build of coordination relations with customers.

In summary, customer integration defines as the process of building a long-term relationship between the customer and the organization which build on mutual trust and the ability to meet customers' needs.

2.5. Sustainable Development Concept:

Sustainable development seeks to strike balance between different and even conflicted needs and our awareness to limited economic, environmental and community resources.

Sustainable development is an approach for change depending on optimal use of resources, rational investment, technological development and institutional change. This can be achieved through harmonious employment of current and future potential to meet needs and aspirations of people. Importantly, sustainable development has advantages on the short, mid and long-terms for both present and future generations. The sustainable development functions have impacts on almost everyone, and also have effects on the community (including citizens, government, NGOs, international organizations, etc...).

WCED (1987:43) deified sustainable development as “Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs”. Dernbach (2001)

proclaimed that sustainable development has developed within the past two decades as a new way of deal with the environment and its relationship to everything else we care about as the society. Rogers, et. al. (2007:42) mentioned that sustainable development is a vital process of change in which the exploitation of resources, the tendency of investments, the orientation of technological development, and organizational change are made consistent with future as well as present need. Kurlavicius (2009) suggested that sustainable development is needed to sustain the coming improvements in human welfare, in health, in human skills, and in social equity. Shukla, et. al. (2010:30) stated that sustainable development emerged as a way of worth considering in the environmental and social values of business decisions alongside their economic value. Stoddart (2011) declared that a responsibility of society is to achieve the equity of sustainable development dimensions, in order to address the needs of future generations. Akan and Okumus (2012:442) said that the sustainable development patterns achieve by regulate the industrial structure, promote the utilization rate of resources, reinforce the sources of energy and develop green pollution-free products. Muys (2013:1) mentioned that sustainable development is improvement aspect of the change in the energy that is available and increase of human prosperity and well-being without loss of the structure and functioning of the ecosystem. Finally; Rache (2015) described that key feature of sustainable development is; an environmental, social, and economic integration into all aspects of decision making.

In conclusion based on the above discussions, the study defined sustainable development as the best use of available natural resources, conservation within the right of future generations to those resources and environmental conservation.

.6. Sustainable Development Dimensions:

Sustainable development consists of three major dimensions; social responsibility, economic responsibility and environmental responsibility.

2.6.1. Social Responsibility Concept:

Social responsibility is referred to as a voluntary obligation by companies to considerate the social effects of its functions. Companies are not isolated islands from the company where they operate. The employees are members of the larger community, and any activity that is intended to benefit the community will serve the interest of the employees without jeopardizing a company's profitability or its investment projects.

As social responsibility is an essential element in the sustainable development process, economic enterprises have the obligation to work collaboratively with the community actors to improve the living standards and serve both the economic and development.

Dale and Newman (2008:3) proclaimed " the mobilization of social capital for building diverse network formation is a necessary condition for sustainable community development". Kolk and Tulder (2010:2) mentioned that absence of regulation on social domains can be considered as a problem for corporations. Peeters (2011:6) stated social sustainability, a crucial issue for social work. Bijl (2011:160) said that citizens need from the companies; participate into social responsibility contribution effectively. Saeidi, et. al. (2014:2) claimed the organizations must meet the expectations of society as basic priorities when they plan their strategies. Bluszcz and Kijewska (2014:443) mentioned social responsibility of companies; enhance their competitive advantage by strengthening relationships with stakeholders. Gubaidullina (2015:236) said to achieve sustainable economic and environmental development, should attention to the priorities of human well-being.

In summary, the study defined the social responsibility as the organization's commitment to participate in the different social activities to achieve an accepted level of social well-being.

2.6.2. Economic Responsibility Concept:

The economic enterprise is viewed as a productive unit on the macroeconomic level of a state. The economic enterprise operates within a dynamic economic environment. It is interactively influence and being influenced by that economic environment. For instance the economic enterprise gain as inputs the raw materials, money, labor, knowledge and technology and produce as outputs the products and services needed by the community. At this point, it is argued that the corporate economic responsibility includes different activities that contribute to economic growth of a country, most importantly foreign investments, paying taxes, and reduce unemployment rates.

Muys (2013:1) stated that from the economic responsibilities patterns; search of alternative methods from the sources of energy. Mangra, et. al. (2014:2) proclaimed that the company's environmental management is seeking to achieve integration between the environment and the economic. Mishra and Dash (2014:50) claimed that the economic responsibility; develop the current and future economic growth of a country. Moisescu (2015:143) stated that it is necessary to create a balance, stability between economic growth and sustainable development to avoid a harmful economic growth. Irina-Elena (2015:145) said economic growth is a vital issue to achieve sustainable development in the long term.

In conclusion, the best definition of economic responsibility is a continuous ability process to support the local economic growth.

2.6.3. Environmental Responsibility Concept:

Environmental responsibility targets achieving a number of environmental objectives including rational use of none-renewable resources, carefulness with the limited capacity of the environment regarding waste, recycling of industrial waste, reducing pollution, ..Etc.

Hutchins and Sutherland (2008:1690) stated that environmental life cycle assessment was becoming an increasingly effective tool for determining environmental impacts. Kemp (2010:200) said that companies should use development equipment's into its operations processes, especially in the geographic proximity of communities. Bijl (2011:161) stated that environmental responsibility aimed to reduce the pollution. Fujii, et. al. (2012:19) said the manufacturing firms which seeking to improve their profitability; they should commitment in environmentally friendly behaviors such as reduce CO2 emission. Sadek and El-Attar (2012:120) declared that the waste recycling has become more popular in latest years, as it can lead to achieve positive advantages to environment. Thatte and Chande (2014:30) stated that mission of environmental protection is enormous; so it is necessary to build an effective collaborative management system. Rostamzadeh, et. al. (2015:189) claimed that environmental responsibility is protecting the environment by summons all organizations to comply with international standards and implement environmentally friendly strategies.

In summary, the environment responsibility defined as the process that aims to reducing the environmental burden and resources conserving.

2.7. Relationships between Variables:

Based on the prior studies and review of the related literature, it was possible to infer the relationship between the supply chain integration and sustainable development with meaningful discussion. To the knowledge of the researcher, there were few studies that directly addressed such relationship. However, the related studies generally investigated the extent of impact of the supply chain on sustainable development dimensions economically, environmentally and socially. There are some studies that called for effective supply chain management for achieving sustainable development with its three dimensions. This study differs from the previous studies in that it is the first that was conducted in Jordan to investigate the integration between supply chain (supplier integration, internal integration, and customer integration) and relationship with the sustainable development in the phosphate fertilizer manufacturing sector in Jordan.

Some of the studies linked the supply chain and its impact extent on the sustainable development from the environment aspects. Hilson and Murck (2000:237) stated that it can achieve sustainable development of the environment by adjusting the internal processes in the corporations through the five recommendations; improved planning, improved environmental management, cleaner technology implementation, increased stakeholder involvement, and improved training. Kemp (2009:205) declared that global mining companies have made strong commitments to community by poverty reduction, human development, and participation in environmental improvement. Yildiz and Yercan (2011) mentioned that the flow of industrial materials from one process to another and energy consumption; had an impact on the natural environment. Rostamzadeh, et. al (2011) stated that environmental responsibility should focus on one of the most important aspect in today‘s world, through the environment protection from the hazards caused by industrialization and other technological. Muduli and Barve (2011) declared that limitation

of industrial waste in the manufacturing processes such as hazardous material can be regarded as a basic goal in supply chain management to achieve the sustainable development.

Finally; some of the studies recommended the corporations to bear the environmental responsibility to reinforce the sustainable development. The lack of commitment to environmental responsibility by the organizations such as; natural resources consumption at a rate below the natural regeneration or search about an alternative of resources, generating gases emissions and not being engaged in activities that can end degrade the environment system (Zhu and Sarkis 2004). Some of the studies linked the supply chain and its impact on the social sustainability. Dam and Petkova (2014) proclaimed that social sustainability responsible about goodwill with customer attraction and retention, goodwill with qualified and committed workforce, reduced training costs, and productivity and profits growth. Gualandris, et. al (2014) stated the supply chain management that applied fair compensation policy, diversity and nondiscriminatory issues such as non-racism and non-nepotism, and friendly industrial relationship; achieved social justice system.

From the economic aspect; little of studies mentioned to relation among supply chain and sustainable development. Gunasekaran and Angappa (2015) declared that supply chain participated to enhance the economic aspect through, quality improvement of the market performance, and shareholder value. Finally; some studies examined necessary duties for the supply chain towards achieving sustainable development. Muduli and Barve (2011) said that the challenges face the supply chain which participates to not reinforce the sustainable development; resistance to change and adoption, insufficient pressure from society, technical barriers, financial constraints, lack of top management commitment, and lack of employee's commitment. Titus, et. al. (2012) declared main issues that effect on the supply chain to achieve the sustainable development; were high cost of transportation

arising from bad road network, limited availability of local suppliers, uncertain lead times, Government Regulations restriction, and high original equipment manufacturers price. Labuschagne, et. al. (2005:1) stated business must integrate its objectives of sustainable development (environmental performance, social equity and economic efficiency) into its operational practices to achieve business sustainability. Singhry (2015) mentioned that if there isn't a good management of the supply chain, which involves decisions concerning sourcing, manufacturing, transporting, consumption, and logistics; sustainable development will be affected by the consequences of those activities; include depletion of the natural resources, endangered environment, negative societal norms, and unemployment.

2.8. Previous Studies:

In this section, the study provides an overview of the previous studies were concerning with the two major variables (supply chain integration and sustainable development).

Clift and Wright (2000) study titled: **"Relationships between environmental impacts and added value along the supply chain"** examined how environmental impacts and economic value build up along the supply chain of a product. The data were obtained from the different mobile telephones factories. The finding showed that primary resource industries give rise to environmental impacts disproportionate to the associated added value. This simple result has important implications for the positioning of companies in the supply chain, for the developing economies, and for the re-use and recycling of manufactured goods.

Zhu and Sarkis (2004) study titled: **"Relationships between operational practices and performance among early adopters of green supply chain management practices in Chinese manufacturing enterprises"** aimed to examine the relationships between

GSCM practice and environmental and economic performance. The data were collected from 186 respondents Chinese manufacturing enterprises. The findings showed that two primary types of management operations philosophies, quality management and just-in-time (or lean) manufacturing principles, influence the relationship between GSCM practices and environmental and economic performance.

Huo, et. al. (2005) study titled: **"Power, Relationship Commitment and Supply Chain Integration between Manufacturer and Supplier"** attempted to identify and analyze the power, relationship commitment, supply chain supplier integration and manufacturers performance. The sample was random from manufacturing companies within the supply chains from Mainland China and Hong Kong by using the telephone. The findings showed the factors of the supplier integration (power and relationship commitment) and the relationship between the factors and supplier integration to enhance the organization performance.

Vachom and Mao (2008) study titled: **"Linking supply chain strength to sustainable development: a country- level analysis"** attempted to investigate the link between supply chain characteristics and sustainable development at the country level. The data were obtained from the global competitiveness report (2004-2005) and 2005 environmental sustainability index. The findings showed that supply chain strength is positively linked to all three dimensions of sustainable development.

Prajogo and Olhager (2009) study titled: **"The effect of supply chain information integration and logistics integration on firm performance"** investigated the integration of both materials and information between supply chain partners. The data were obtained from 232 Australian firms. The study emphasized that logistics integration has a great effect on operations performance also the information technology capabilities and information sharing both have significant effects on logistics integration.

Boon-itt (2011) study titled: **"Achieving Product Quality Performance: The Roles of Supply Chain Integration and Information Technology"** proposed to increase the understanding of supply chain integration application through select the appropriate types of information technology. The data collected from 111 (production and purchasing) managers in the automotive industry. The findings showed that different information technology types can be configured to enhance product quality by linking between supply chain integration strategies and product quality performance. The study recommended that the extent of interaction effect of support information technology to enhance the effectiveness of supply and customer integration.

Salhieh (2011) study titled**: "An Exploratory Study of the Relationship between Supply Chain Management Practices and Technical Efficiency of Jordanian Manufacturing Companies"** aimed to the relationship between (SCM) practices and organizational financial performance. Data were collected through 28 manufacturing companies. The findings showed that there were a strong relationship between (SCM) practices and bottom-line profits of an organization.

Yang, et. al. (2011) study titled: **"Impact of lean manufacturing and environmental management on business performance: An empirical study of manufacturing firms"** aimed to find the relationships between lean manufacturing practices, environmental management and business performance. The data collected from 309 international manufacturing firms. The study emphasized that the lean manufacturing related positively to environmental management practices and environmental management practices alone related to the market and financial performance.

Zulkiffli and Perera (2011) study titled**: "The influence of levels supply chain integration on the relationship between corporate competitive capabilities and business performance: evidence from Malaysian SEMs"** aimed to identify the

influence of levels of supply chain integration as a moderate variable on the relationship between business performance and corporate competitive capabilities. The data were obtained from 135 Malaysian manufacturing SMEs. The findings showed that the levels of supply chain integration were a moderate relationship between corporate competitive capabilities and business performance.

Zailani, et. al. (2012) study titled: **“Sustainable supply chain management (SSCM) in Malaysia: A survey”** aimed to examine the extent of implementation of sustainable supply chain management practices also the outcomes of these practices on sustainable supply chain performance. The data were composed from 400 manufacturing firms in Malaysia. The study found that environmental purchasing has a positive effect on three categories of outcomes (economic, social and operational), whereas sustainable packaging has a positive effect on environmental, economic and social outcomes. The results have empirically proven that SSCM practices have a positive effect on sustainable supply chain performance, particularly from the economic and social perspective.

Titus, et. al. (2012) study titled**: “Environmental Factors that influence Supply Chain Management Implementation in the Manufacturing Industries in Kenya: A Case of Manufacturing Industries in Nairobi, Kenya”** attempted to identify and analyze the factors affecting on the implementation of (SCM) in the manufacturing industries in Kenya. The data were obtained from 52 large private manufacturing entities in Nairobi. The study emphasized that there were a low levels implementations of (SCM) systems in the manufacturing industries in Kenya. Two factors were encouraged the supply chain management implementation demand by stakeholders and the perceived benefits, Government support and the cost of developing and running supply chain were two factors led to disturb the implementation of supply chain management systems .

Mustaq and Azeem (2012) study titled: **"Conceptual Understanding of Sustainable Development"** aimed to examine the opinion of teachers about environmental sustainable development and its importance in present and in future. The data were obtained from 247 teachers. The findings showed that the level of education, gender and location not influence on the environmental sustainable development and its importance in present and in future.

Iqbal, et. al. (2012) study titled: **"Impact of Corporate Social Responsibility on Financial Performance of Corporations: Evidence from Pakistan"** aimed to explore the relationship of corporate social responsibility, financial performance, market value of the share and financial leverage. The data collected from 156 firms included of textile sector, chemical sector, cement sector and the tobacco sector. The findings showed that corporate social responsibility not effect on the financial performance.

Zhang, et. al. (2012) study titled: **"Pushing the Frontier of Sustainable Service Operations Management: Evidence from US hospitality industry"** aimed to develop a performance measurement system of environmental sustainability in service regulations. The data were collected through 984 US hotels. The findings showed that there was a positive relation connects between operating performance and environmental sustainability; also the operating structure has a significant influence on the operating performance.

Haque and Islam (2013) study titled: **"Effects of Supply Chain Management Practices on Customer Satisfaction: Evidence from Pharmaceutical Industry of Bangladesh"** aimed that the (SCM) practices can significantly impact on customer satisfaction of drug manufacturers in the pharmaceutical industry. The data were obtained from the managers and executives of various drug manufacturers in the pharmaceutical industry of Bangladesh. A total of 160 respondents with a response rate of (48%)

participated in the study. The finding showed that (SCM) practices include three dimensions, namely, collaboration and information sharing, logistics design and IT infrastructure, and organizational culture. However, while the first two exert their impact on customer satisfaction, organizational culture does not have any influence on it.

Qayyum, et. al. (2013) study titled: **“The Impact of Supply Chain Management Practices on the Financial Performance of the Organization”** aimed to find the impact of supply chain on financial performance of an organization. The data were collected through 30 questionnaires, were distributed among the managers of the two organizations. The finding showed that there is a direct impact of the dimensions associated of the supply chain on the overall performance of the organization.

Chin, et, al. (2013) study titled: **“Mediating Effect of Operational Cooperation between Supply Chain Practices and Firm Performance”** aimed that the operational cooperation reinforce the strength of firms to overcome with uncertainty and solid competition through supply chain collaboration. The data were collected from 201 small manufacturing firms. The findings showed that the relationship between supply chain practices and firm performance were intermediate through the operational cooperation.

Gorondutse (2013) study titled: **“Effect of Corporate Reputation and Commitment of Business Social Responsibility (BSR) on Performance: Evidence from Manufacturing Sector in Nigeria”** aimed to examine the values in developing nation specially Nigeria, and how it’s related to performance of the manufacturing sector. The data were composed from 1500 manufacturing sector. This study emphasized that there were positive association between organizational performance and corporate reputation.

Agyei, et. al. (2013) study titled: **“The Challenges of Supply Chain in the Gold Mining Sector of Obuasi Municipality of Ghana”** aimed to evaluate the supply chain

challenges facing the gold mining operations in Obuasi and its environs in the Ashanti region of Ghana. The study used survey data collected from three categories 50 senior managers, 75 junior officers and 100 communities' leaders. The findings showed that high cost of transportation arising from bad road network, limited availability of local suppliers, uncertain lead times, the communities' conflict, government regulations restriction, high original equipment manufacturers price, Gold price fluctuation, interest rate volatility and inaccurate order implementation.

Hamad (2013) study titled: **“The Impact of Supply Chain Integration on Organizational Performance and the Role of Environmental Turbulence: An Empirical Study on the food industry firms in Jordan”** attempted to identify and analyze the impact of Supply Chain Integration on Organizational Performance and the Role of Environmental Turbulence on the food industry firms in Jordan. The data were obtained from 121 industrial food firms in Amman city and included 326 different categories of employees. This study emphasized that there were significant impact of the supply chain integration on both of organizational performance and environmental Turbulence in industry food firms of Amman city. The study recommended enhancing the checking of the external environment and adapting to the technological changes, as well as the competition of the food industry.

Abuzaid (2014) study titled: **“The Effect of Supply Chain Management Practices on Strategic Flexibility: Applied Study on the Jordanian Manufacturing Companies”** aimed to identify the effect of (SCM) practices on the strategic flexibility of Jordanian manufacturing companies. The data were collected from 93 managers working in the target companies. The findings showed that the (SCM) practices positively effect on strategic flexibility and the significant effect on the relationship with customers, while the lowest effect on the quality of information sharing. Also the findings showed that the

information sharing level has the highest effect on market flexibility and the strategic partnership with supplier has the highest effect on production flexibility, while the relationship with customers has the highest effect on competitive flexibility.

Didonet, et. al. (2014) study titled: **"The Role of Supply Chain Integration in the Relationship between Market Orientation and Performance in SMEs"** provided useful guidelines in the verify the alignment between market orientation and supply chain integration practices for improving performance in small and medium-sized enterprises (SMEs). The data collected from 327 SMEs to verify the relationships. The findings showed that the relationship between market orientation and supply chain integration was found to be strong and positive. The study recommended the generation of information in market oriented SMEs favors their sharing information both inter- and intra-organizational.

Florian and Constangioara (2014) study titled: **"The Impact of Risks in Supply Chain on Organizational Performances: Evidence from Romania"** attempted to identify and analyze the relationship between organizational performances and risks in the context of Romanian supply chains. The samples were random of 64 Romanian companies from various industries. This study emphasized that a supply chain risk management strategy successfully mitigates the negative consequences of risks.

Enríquez, et. al. (2014) study titled: **"The Influence on the Performance of Supply Chain Management on Small and Medium Business Manufacturing Production Processes in Mexico"** investigated the effect of Supply Chain Management on production processes, to analyze the performance of manufacturing SMEs. The data were collected from 120 companies which employ between 10 and 250 employees. The study emphasized that there were a positive influence on both the company's production processes and yield.

Koech, et. al. (2014) study titled: **"Components of Supply Chain Management in the Manufacturing Sector"** aimed to survey the extent of implementation the (SCM) in the manufacturing sector by improving the productivity to enhance the organization's position in global market. The data were collected from 15 of the manufacturing industries in Nakuru town, Kenya. The sample included the top and lower managers. This study emphasized that there are specific components of (SCM) in the manufacturing sectors. The study recommended the management to bring attention to the (SCM) and facilitate identification of components of (SCM) in the manufacturing sector.

Ding (2014) study titled: **"A Study on Relation of Corporate Social Responsibility and Corporate Financial Performance or Corporate Value: Empirical Evidence from Listed Real Estate Companies"** aimed to investigate the relationship between corporate social responsibility and corporate financial performance. The data were obtained from 112 of the real estate companies. The findings showed that by increasing of the (CSR) activities led to affect positively on the financial performance, as well as the increasing of the (CSR) activities undertaken to consumers led to increase the corporate value.

Khan, et. al. (2015) study titled: **"The Effect of Buyer-supplier Partnership and Information Integration on Supply Chain Performance: An Experience from Chinese Manufacturing Industry"** provided a useful guidelines in the effect of Buyer-Supplier partnership and information integration on supply chain performance. The data were collected from 218 Chinese manufacturing industries. The findings showed that Buyer- supplier partnership and information integration have a significant influencing relation on supply chain performance.

Chaghooshi, et. al. (2015) study titled: **"The Effect of Supply Chain Management Processes on Competitive Advantage and Organizational Performance (Case Study:**

Food Industries based in West Azerbaijan Province)" aimed on the effects of supply chain management processes on the competitive advantage and organizational performance of companies operating in the food industry. The data were obtained from 108 senior managers in the food industry through questionnaires. This study emphasized the correlation between competitive advantage, supply chain management processes and organizational performance, significant positive relationship.

Agus (2015) study titled: **"Supply Chain Management: The Influence of SCM on Production Performance and Product Quality"** aimed to examine the importance of (SCM) integration in the Malaysian manufacturing industry and how it effects on product quality and production performance. The sample composed from 250 manufacturing companies. The findings showed that the production performance rear partially mediates the linkage between (SCM) and product quality.

2.9. Expected Contributions of the Current Study as Compared with Previous Studies:

In light of reviewing previous literatures, the study expects that this work will add value to previous researches as follows:

1- Supply Chain Integration: The study will increase awareness about the role of the (SCI) in the (SD).

2- Purpose: There is no study examined the effect of supply chain integration on sustainable development in the field of Phosphate Fertilizer Manufacturing companies in Jordan.

3- Environment: This research will be a great benefit, especially in the Jordan, as it the most important sector and the results can generalize to the other countries that have the same environment.

4- Industry: There was no any research carried out on Phosphate Fertilizer Manufacturing about the (SCI). The current research is dedicated to Phosphate Fertilizer Manufacturing Companies only.

5- Methodology: Most previous studies were based on case studies of different organizations and industries. The current study is based on perception.

6- Population: Most previous researches considered public and private organizations, while the current study covered private organizations, but also will capitalize public organizations.

Chapter Three:
Methods and Procedures

3.1. Study Methodology:

The current study is considered as a causality study. It aims at investigating the effect of supply chain integration elements on sustainable development of Jordanian phosphate fertilizer manufacturing companies. The questionnaire was the main tool to collect the data, which has been built based on previous studies, and adapted to match with the phosphate fertilizer industry, then developed through referee committee (panel of judges) which included many academicians and professionals, as per Appendix (1). Then data have been collected from managers working at the targeted companies, then verified and coded on SPSS. After confirming the questionnaire validity, reliability and normality, the statistical analysis, correlation and regressions were carried out. Finally, the results compared with previous studies results.

3.2. Study Population, Sample and Unit of Analysis:

3.2.1. Population and Samples:

Table: (3.1) shows that there are three main companies detonated this industry in Jordan: Jordanian Indian Fertilizer Company, Jordan Phosphate Mines Company and Indo Jordan Chemical (JIFCO, JPMC and IJC). Therefore, these companies were chosen to fulfill the purpose of this study, which negate the need for sampling.

Table (3.1): Jordanian Phosphate Fertilizer Manufacturing Companies Profiles

No	Company Name	Year of Establish	No of Managers
1	Indo Jordan Chemical (IJC)	1992	40
2	Jordanian Indian Fertilizer Company (JIFCO)	2008	50
3	Jordanian Phosphate Mines Company (JPMC)	1949	210
Total	**3**	**-**	**300**

Source: prepared by the researcher

3.2.2. Unit of Analysis:

The survey unit of analysis is composing of all managers at three levels (top level, middle level and operational level), who are working at these companies (JIFCO, JPMC and IJC). And who was available at the time of conducting the survey.

3.3. Data Collection Method (Tools):

To actualize the current study the data were collected from two sources (primary and secondary):

Secondary Data: Secondary data were collected from different sources such as journals, working papers, researches, thesis, articles and Internet and Jordanian Phosphate Fertilizer Manufacturing Companies' profiles.

Primary Data: Primary data were collected by questionnaire, which was prepared based on literature review and developed based on referee committee.

3.3.1. Tool of Collecting Data:

To implement the current study, the questionnaire was used, which included 48 questions. As shown in Appendix (5).

3.3.2. Questionnaire Variables:

The questionnaire included three parts, as follows:

1- Demographic dimensions such as: gender, age, qualification, experience, position and department.

2- Independent variables (Supply Chain Integration) which included three sub-variables: supplier integration, internal processes integration, and customer integration, each sub-variable was tested by 8 items (from item 1 to item 24).

3- Dependent variable (Sustainable Development) which composed of three dimensions as follows: social responsibility, economic responsibility and environmental responsibility. Each dimension was measured by 8 items (from item 25 to item 48).

All questionnaire items were measured by five-point Likert-type scale related to respondent's perceptions, varying from value 1 (strongly disagree) to value 5 (strongly agree) that was used through the study questionnaire.

3.4. Data Analysis:

The total number of managers working at these three companies is about 300 managers. To collect the imperial data 135 questionnaires were distributed to the three levels of managers are working at the mentioned above companies Appendix (2) during March, 2016. All questionnaires were collected back, then after verifying them, only 102 questionnaires or 75.5% were suitable for further analysis. These questionnaires were coded against SPSS 20.

3.4.1. Validity Test:

Two methods were used to confirm the questionnaire validity:

First: Content validity, multiple sources of data (literature such as previous studies, expert interviews) were used to develop and refine the model and measures.

Second: Face validity, panel of judges was carried out to modify the finale version of the questionnaire (Sekaran 2003).

3.4.2. Reliability Test (Cronbach’s Alpha):

To test reliability, Cronbach’s Alpha will be used. If the Cronbach's Alpha coefficient value is more than 60%, then reliability will not be violated (Sekaran 2003). Table (3.2)

shows that Cronbach's Alpha coefficient values for independent variables were ranging between 0.811 and 0.891 and for dependent variables were ranging between 0.807 and 0.881 which means that Cronbach's Alpha coefficient value is accepted.

Table (3.2): Reliability Test for all Variables

Variables	No. of Items	Cronbach's Alpha
Supplier Integration	8	0.811
Internal Integration	8	0.891
Customer Integration	8	0.873
Supply Chain Integration	**3**	**0.785**
Social Responsibility	8	0.881
Economic Responsibility	8	0.807
Environmental Responsibility	8	0.843
Sustainable Development	**3**	**0.794**

3.4.3. Normality Test:

One-Sample Kolmogorov-Smirnov (KS Z) test is used to test normality. If the significance of KS (Z) is more than 5% then normality was assumed. Table (3.3) shows that the significance of all variables and sub-variables are more than 5% except social responsibility, which mean that normality is not violated.

Table (3.3): One-Sample Kolmogorov-Smirnov Test

Variables	Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)
Supplier Integration	0.770	0.594
Internal Integration	1.286	0.073
Customer Integration	0.950	0.328
Supply Chain Integration	**0.875**	**0.428**
Social Responsibility	1.541	0.017
Economic Responsibility	1.040	0.230
Environmental Responsibility	0.665	0.769
Sustainable Development	**0.656**	**0.783**

3.5. Respondents' Demographic Description:

Table (3.4) shows the general characteristics of the respondents in terms of gender, age, qualification, experience, position and department.

1- Gender: It seems that most respondents are male with 93 (91.2%) while the female is 9 respondents (8.8%) which represents. This indicates that our Arabian habits not allow for females to work in areas far from their residence.

2- Age: It is clear that the most respondent ages are between 46 and 55 years old (34.3%). This indicates to the administrative level of the participants.

Table (3.4): Demographic Analysis

Dimension		Frequency	Percent	Valid Percent	Cumulative Percent
Gender	Male	93	91.2	91.2	91.2
	Female	9	8.8	8.8	100.0
	Total	**102**	**100.0**	**100.0**	
Age	Between 25-35 years	30	29.4	29.4	29.4
	Between 36-45 years	28	27.5	27.5	56.9
	Between 46-55 years	35	34.3	34.3	91.2
	≥56 years	9	8.8	8.8	100.0
	Total	**102**	**100.0**	**100.0**	
Qualification	Diploma	13	12.7	12.7	12.7
	Bachelor	69	67.6	67.6	80.4
	Master	16	15.7	15.7	96.1
	Doctorate	4	3.9	3.9	100.0
	Total	102	100.0	100.0	
Years of Experience	Less than 5 years	11	10.8	10.8	10.8
	Between 5-10 years	21	20.6	20.6	31.4
	Between 11-15 years	4	3.9	3.9	35.3
	>15 years	66	64.7	64.7	100.0
	Total	**102**	**100.0**	**100.0**	
Position	High Management Level	21	20.6	20.6	20.6
	Medium Management Level	62	60.8	60.8	81.4
	Operational Management Level	19	18.6	18.6	100.0
	Total	**102**	**100.0**	**100.0**	
Department	Management	56	54.9	54.9	54.9
	Production	21	20.6	20.6	75.5
	Quality	11	10.8	10.8	86.3
	Marketing	14	13.7	13.7	100.0
	Total	**102**	**100.0**	**100.0**	

3- Qualification: It seems that the most respondents hold Bachelor degree with 69 (67.6%) respondents, while the least academic qualification degree is doctorate with 4 respondents (3.9%).

4- Years of experience: It's clear that most respondent years of experience are more than 15 years with 66 respondents (64.7%), while the least years of experience are between 11-15 years with 4 respondents (3.9%).

5- Position: Its obviously clear that the most respondent are from the middle management level with 62 respondents (60.8%), while the least respondents from the top management level with 19 (18.6%).

6- Department: It seems that the most respondent are working in management department with 56 respondents (54.9 %), while the least respondent are from quality department with 11 respondents (10.8%).

Chapter Four:
Analysis and Results

4.1. Introduction:

This chapter includes three sections: statistical analysis (mean, standard deviation, t-value, importance and ranking), after that bivariate Pearson correlation and finally simple and multiple regressions.

4.2. Study Statistical Variable Analysis:

This section describes both independent and dependent variables from statistical point of view through means, standard deviations, t-values, importance and ranking.

The importance of each variable and item will be calculated based on the following equation:

Interval: (5-1)/3 = 1.33.

1- Low: lies between 1 and 2.33(1 + 1.33 = 2.33).

2- Medium: lies between 2.34 and 3.67 (2.34+ 1.33 = 2.34-3.67).

3- High: lies between: 3.68 up to 5.

A- Independent Variables Analysis:

Does supply chain integration affect sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies? To answer this question, the researcher used the following: Mean, Standard Deviation, Importance and Ranking.

Table (4.1) shows that the means of supply chain integration variables ranges from 3.511 to 3.800, with standard deviation ranges between 0.59 to 0.71, which mean that there is semi agreement among respondents on medium to high importance of these variables.

The average mean of supply chain integration is 3.622, with standard deviation of 0.535, which means that there is an agreement on medium importance of supply chain integration. The value of t confirm the above results, where (t=11.736>1.980). The customer integration has rated the highest, followed by internal processes integration and finally supplier integration.

Table (4.1): Mean, Standard Deviation, Importance and Ranking of Independent Variables

Item	Mean	S.D.	t-Value	Importance	Ranking
Supplier Integration	3.511	0.59	8.675	Medium	3
Internal Processes Integration	3.555	0.71	7.867	Medium	2
Customer Integration	3.800	0.61	13.324	High	1
Supply Chain Integration	**3.622**	**0.535**	**11.736**	**Medium**	

t-Tabulated = 1.980

Supplier Integration:

Table (4.2) shows that the means of supplier integration items ranges from 3.05 to 3.85, with standard deviation ranges between 0.813 to 1.084, which mean that there is a semi agreement among respondents on medium to high importance of these items.

Table (4.2): Mean, Standard Deviation, Importance and Ranking of Supplier Integration Items

No.	Item	Mean	S.D.	t-Value	Importance	Ranking
1.	The company maintains a complete profile of the suppliers	3.85	0.813	10.593	High	1
2.	The company sends/receives data to/from suppliers via the Internet	3.84	0.887	9.598	High	2
3.	The company gains best price offer for the raw-material	3.48	0.952	5.098	Medium	4
4.	The company acquires quality raw-materials as needed	3.29	0.907	3.273	Medium	7
5.	The company makes order at suppliers timely	3.72	0.837	8.636	High	3
6.	The company receives raw-materials just-on-time	3.46	0.829	5.616	Medium	5
7.	The company shares expertise with the suppliers	3.39	0.914	4.335	Medium	6
8.	The company organizes training programs jointly with its suppliers	3.05	1.084	0.457	Medium	8
	Supplier Integration	**3.51**	**0.594**	**8.675**	**Medium**	

t-Tabulated = 1.980

The average mean of supplier integration is 3.51, with standard deviation of 0.594 which means that there is an agreement on medium importance of suppler integration. The value of t confirm the above results, where (t=8.675>1.980).

Internal Processes Integration:

Table (4.3) shows that the means of internal processes integration items ranges from 3.18 to 3.74, with standard deviation ranges between 0.812 to 1.238, which mean that there is semi agreement among respondents on medium to high importance of these items. The average mean of internal processes integration is 3.55, with standard deviation of 0.713 which means that there is an agreement on medium importance of internal processes integration. The value of t confirm the above results, where (t=7.867>1.980).

Table (4.3): Mean, Standard Deviation, Importance and Ranking of Internal Processes Integration Items

No.	Item	Mean	S.D.	t-Value	Importance	Ranking
9.	There is continuous interdepartmental coordination in the company	3.71	0.874	8.156	High	2
10.	Interdepartmental data sharing is performed timely.	3.69	0.867	7.992	High	3
11.	The company applies warehousing management strategies	3.74	0.855	8.684	High	1
12.	The company holds training sessions for the employees on continuous basis	3.18	1.238	1.440	Medium	8
13.	The company schedules the interdepartmental production processes	3.67	0.812	8.287	Medium	4
14.	The company is careful about reducing time cycle for a process	3.56	0.907	6.220	Medium	5
15.	The company encourages boss-employee communications on continuous basis	3.43	1.039	4.193	Medium	7
16.	There is continuous interdepartmental coordination in the company	3.48	0.909	5.337	Medium	6
	Internal Processes Integration	**3.55**	**0.713**	**7.867**	**Medium**	

t-Tabulated = 1.980

Customer Integration:

Table (4.4) shows that the means of customer integration items ranges from 3.06 to 4.02, with standard deviation ranges between 0.718 to1.007, which mean that there is semi agreement among respondents on medium to high importance of these items. The average

mean of customer integration is 3.800, with standard deviation of 0.606, which means that there is an agreement on high importance of customer integration. The value of t confirm the above results, where (t=13.324>1.980).

Table (4.4): Mean, Standard Deviation, Importance and Ranking of Customer Integration Items

No.	Item	Mean	S.D.	t-Value	Importance	Ranking
17.	The company has a customer database	3.77	0.932	8.389	High	6
18.	The company communicates with customers online	3.78	0.779	10.171	High	5
19.	The company delivers orders to customers timely	3.80	0.809	10.038	High	3
20.	The company offers quality product to the satisfaction of customers	3.87	0.792	11.128	High	2
21.	The company offers competitive products in terms of price	3.75	0.841	8.952	High	7
22.	The company provides for suitable transport means to deliver shipments to customers safely.	3.60	1.007	5.995	Medium	8
23.	The company shows interest with customer complaints and suggestions	3.80	0.718	11.307	High	3
24.	The company is motivated by customer satisfaction	4.02	0.758	13.593	High	1
	Customer Integration	**3.800**	**0.606**	**13.324**	**High**	

t-Tabulated = 1.980

B- Dependent Variables Analysis:

Does supply chain integration affect sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies? To answer this question, the researcher used the following: Mean, Standard Deviation, Importance and Ranking.

Table (4.5) shows that the means of sustainable development dimensions ranges from 3.344 to 3.878, with standard deviation ranges between 0.574 and 0.783, which mean that there is semi agreement among respondents on medium to high importance of these dimensions. The average mean of sustainable development is 3.582, with standard deviation of 0.587, which means that there is an agreement on medium importance of sustainable development. Value of t confirm the above results, where (t=10.023>1.980).

The economic responsibility has rated the highest, followed by social responsibility and finally environmental responsibility.

Table (4.5): Mean, Standard Deviation, Importance and Ranking of Dependent Variables

Item	Mean	S.D.	t-Value	Importance	Ranking
Social Responsibility	3.524	0.783	6.766	Medium	2
Economic Responsibility	3.878	0.574	15.489	High	1
Environmental Responsibility	3.344	0.721	4.823	Medium	3
Sustainable Development	**3.582**	**0.587**	**10.023**	**Medium**	

t-Tabulated = 1.980

Social Responsibility:

Table (4.6): Mean, Standard Deviation, Importance and Ranking of Social Responsibility

No.	Item	Mean	S.D.	t-Value	Importance	Ranking
25.	The company provides physical support to local NGOs	3.61	1.016	6.041	Medium	3
26.	The company provides health insurance plan to employees and their families	4.26	0.703	18.180	High	1
27.	The company provides health insurance plan for retired employees and their families	3.60	1.074	5.623	Medium	4
28.	The company applies a fair salary system	3.17	1.091	1.543	Medium	7
29.	The company supports the higher education for employees and their children	3.22	1.248	1.746	Medium	6
30.	The company provides training centers for local community members	3.05	1.197	0.414	Medium	8
31.	The company cooperates with the universities for scientific research purposes	3.24	1.179	2.016	Medium	5
32.	The company applies public safety measures for the employees	4.06	0.854	12.523	High	2
	Social Responsibility	**3.52**	**0.78**	**6.766**	**Medium**	

t-Tabulated = 1.980

Table (4.6) shows that the means of social responsibility ranges item from 3.05 to 4.26, with standard deviation ranges between 0.703 and 1.248, which mean that there is semi agreement among respondents on medium to high importance of these items. The average mean of social responsibility is 3.52, with standard deviation of 0.78, which means that there is an agreement on medium importance of social responsibility. Value of t confirm the above results, where (t=6.766>1.980).

Economic Responsibility:

Table (4.7) shows that the means of economic responsibility ranges item from 3.39 to 4.24, with standard deviation ranges between 0.704 and 1.091, which mean that there is semi agreement among respondents on medium to high importance of these items. The average mean of economic responsibility is 3.87, with standard deviation of 0.573, which means that there is an agreement on high importance of economic responsibility. Value of t confirm the above results, where (t=15.48>1.980).

Table (4.7): Mean, Standard Deviation, Importance and Ranking of Economic Responsibility

No.	Item	Mean	S.D.	t-Value	Importance	Ranking
33.	The company fulfills all due tax payments	4.17	0.719	16.39	High	2
34.	The company contributes to an increased GDP of the Jordanian economy.	4.24	0.720	17.32	High	1
35.	The company contributes to reduce unemployment rate through allowing training and employment opportunities	4.00	0.704	14.35	High	4
36.	The company attracts foreign investments to support the national economy	3.74	1.014	7.323	High	6
37.	The company generates foreign currency for the country	4.02	0.744	13.83	High	3
38.	The company adopts best practices in exploiting the natural resources	3.71	0.950	7.503	High	7
39.	The company uses energy-saving strategies, and alternate power solutions	3.78	0.991	7.991	High	5
40.	The company diversifies its products offered in the global market	3.39	1.091	3.629	Medium	8
	Economic Responsibility	**3.87**	**0.573**	**15.48**	**High**	

t-Tabulated = 1.980

Environmental Responsibility:

Table (4.8) shows that the means of environmental responsibility ranges item from 2.32 to 4.05, with standard deviation ranges between 0.750 and 1.282, which mean that there is semi agreement among respondents on low to high importance of these items. The average mean of environmental responsibility is 3.34, with standard deviation of 0.721,

which means that there is an agreement on medium importance of environmental responsibility. Value of t confirm the above results, where (t=4.823>1.980).

Table (4.8): Mean, Standard Deviation, Importance and Ranking of Environmental Responsibility

No.	Item	Mean	S.D.	t-Value	Importance	Ranking
41.	The company recycles its industrial waste of gypsum	2.32	1.127	-6.061	Low	8
42.	The company uses modern technology to reduce poisonous emissions	3.48	0.982	4.939	Medium	3
43.	The company uses eco-friendly sources of energy	3.13	1.040	1.237	Medium	7
44.	The company installs waste water treatment plant to protect against pollution of groundwater	3.37	1.143	3.293	Medium	5
45.	The company is careful about using environmentally clean trucks	3.39	1.036	3.825	Medium	4
46.	The company grows trees to increase the vegetation	4.05	0.750	14.13	High	1
47.	The company adheres to domestic and international regulations as to saving the environment	3.81	0.909	9.041	High	2
48.	The company holds training sessions for employees regarding environment issues	3.20	1.282	1.544	Medium	6
	Environmental responsibility	**3.34**	**0.721**	**4.823**	**Medium**	

t-Tabulated = 1.980

4.3. Relationships between the Study Variables:

Table (4.9) shows that the relationships among Supply Chain Integration variables are ranging between 0.433 and 0.692, which means that there are strong to very strong relationships among Supply Chain Integration variables. Table also shows that the relationships among Sustainable Development variables are ranging among 0.529 to 0.607, which means that there are very strong relationships among Sustainable Development variables. The relationships of total Sustainable Development with each Supply Chain Integration variable are strong, where r among 0.473 to 0.767 and the

relationship between Supply Chain Integration and Sustainable Development is strong, where r is 0.749.

Table (4.9): Bivariate Pearson Correlation Test for All variables

			1	2	3	4	5	6	7	8
1	Supplier Integration	Correlation								
		Sig.								
2	Internal processes Integration	Correlation	**.692****							
		Sig.	.000							
3	Customer Integration	Correlation	.538**	**.433****						
		Sig.	.000	.000						
4	Supply Chain Integration	Correlation	.881**	.864**	.769**					
		Sig.	.000	.000	.000					
5	Economic Responsibility	Correlation	.557**	.662**	.408**	.654**				
		Sig.	.000	.000	.000	.000				
6	Environmental Responsibility	Correlation	.541**	.576**	.502**	.646**	**.607****			
		Sig.	.000	.000	.000	.000	.000			
7	Social Responsibility	Correlation	.482**	.697**	.313**	.606**	.585**	**.529****		
		Sig.	.000	.000	.001	.000	.000	.000		
8	Sustainable Development	Correlation	.621**	**.767****	**.473****	**.749****	.881**	.812**	.841**	
		Sig.	.000	.000	.000	.000	.000	.000	.000	

****. Correlation is significant at the 0.01 level (2-tailed).**

4.4. Testing Study Hypothesis:

To test the hypotheses multiple regressions analysis is used to analyze the effect of the supply chain integration variables on sustainable development variable. To be able to use multiple regressions the following assumptions should be fulfilled: Normality, validity, reliability, multi-colleanearity, independence of errors and correlation. F shows the fitness of the model, while R^2 also indicates the variance value between independent and dependent variables of the model (Sekaran 2003).

After conducting the normality, validity and reliability of the study, the correlation test has been carried out to confirm the relationship between variables. The following have to be tested: multi-colleanearity and independence of errors. Durbin-Watson test is used to ensure independence of errors, and Variance Inflation Factor (VIF) and tolerance are used

to test multi-collinearity. If Durbin-Watson test value is about 2 the model does not violate the independence of errors assumption, and if VIF is less than 10 and tolerance is more than 0.2, the multi-collinearity test is assumed.

Table (4.10) shows that Durbin Watson value is (d=1.558), which is around two, so the residuals are not correlated with each other; therefore, the independence of errors is not violated. Table (4.10) result also shows that the VIF values are less than 10 and the tolerance values are more than 0.2, this indicates that there is no multi-collinearity within variables of the study.

Table (4.10): Multi-Collinearity and Durbin-Watson Tests for Main Hypothesis

Variables	Tolerance	VIF	Durbin-Watson
Supplier Integration	0.451	2.217	1.558
Internal Processes Integration	0.516	1.939	
Customer Integration	0.703	1.422	

The Main Hypothesis:

H_{01}: The supply chain integrations do not have effect on sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies, at ($\alpha \leq 0.05$).

Multiple Regressions:

Table (4.11) shows regression of three supply chain integration variables together regressed against dependent variable sustainable development. R^2 explains the variance of independent variables on dependent variables. Since R^2 is 61.7% then the independent variable can explain 61.7% of variance on dependent variable, since (R^2=61.7, F=52.734, Sig.=0.000). Consequently, the null hypothesis is rejected and the alternative hypothesis is accepted, which states that the supply chain integration have effect on sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies, at ($\alpha \leq 0.05$).

Table (4.11): Results of Multiple Regressions Analysis (ANOVA): Regressing Supply Chain Integration Variables against Total Sustainable Development Dimensions.

Model	R	R^2	Adjusted R^2	F	Sig.
1	0.786[a]	0.617	0.606	52.734	0.000

Table (4.12) again shows the significance effect of each independent variable on dependent variable.

Table (4.12): Results of Multiple Regressions Analysis (Coefficients): Regressing Supply Chain Integration Variables against Total Sustainable Development Dimensions.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.839	0.260		3.231	0.000
	Supplier Integration	0.107	0.092	0.109	1.167	0.246
	Internal Processes Integration	0.519	0.072	0.630	7.243	0.000
	Customer Integration	0.137	0.072	0.142	1.902	0.060

Dependent Variable: Sustainable Development

Sub-Hypothesis:

$H_{01.1}$: Suppliers' integration does not have effect on sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies, at (α≤0.05).

Table (4.12) shows that there is no significant effect of supplier integration on sustainable development, since (β=0.109, t=1.167, sig. =0.000, p>0.05). Therefore, the null hypothesis is accepted, which states that the supplier integration does not effect on sustainable development at (α≤0.05).

$H_{01.2}$: Internal processes' integration does not have effect on sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies, at (α≤0.05).

Table (4.12) shows that there is a significant effect of internal processes integration on sustainable development, since (β= 0.630, t=7.243, sig. 0.000, p<0.05). Therefore, the null

hypothesis is rejected and the alternative hypothesis is accepted, which indicates that the internal procsses integration has an effect on sustainable development at (α≤0.05).

$H_{01.3}$: Customers' integration does not have effect on sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies, at (α≤0.05).

Table (4.12) shows that there is no significant effect of customer integration on sustainable development, since (β =0.142, t=1.902, sig. =0.060, p>0.05). Therefore, the null hypothesis is accepted, which states that the customer integration does not effect on sustainable development at (α≤0.05).

In summary, there was a high significant effect for internal processes integration on sustainable development, while there were not significant effects for supplier and customer integration on sustainable development.

Simple Regression:

Supplier Integration:

$H_{01.1}$: Suppliers' integration does not have effect on sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies, at (α≤0.05).

Table (4.13): Results of Simple Regressions Analysis (ANOVA): Regressing Supplier Integration against Total Sustainable Development Dimensions.

Model	R	R^2	Adjusted R^2	F	Sig.
1	0.621[a]	0.386	0.379	62.743	0.000

Table (4.13) shows that when we regress supplier integration against total sustainable development R^2 is equal to 0.386, which means that variation in supplier integration can explain 38.6% of total sustainable development, where (R^2=0.386, F=62.743, Sig.=0.000).

Table (4.14): Results of Simple Regressions Analysis (Coefficients): Regressing Supplier Integration against Total Sustainable Development Dimensions.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.431	0.276		5.192	0.000
	Supplier Integration	0.613	0.077	0.621	7.921	0.000

Dependent Variable: Sustainable Development

Table (4.14) shows that supplier integration has 62.1% effect on total sustainable development, where (β=0.621, t=7.921, Sig. =0.000). Therefore the null hypothesis is rejected and the alternative is accepted which states that: Suppliers' integration has an effect on sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies, at (α≤0.05).

Internal Processes Integration:

$H_{01.2}$: Internal processes' integration does not have effect on sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies, at (α≤0.05).

Table (4.15): Results of Simple Regressions Analysis (ANOVA): Regressing Internal Processes Integration against Total Sustainable Development Dimensions.

Model	R	R^2	Adjusted R^2	F	Sig.
1	0.767[a]	0.588	0.584	142.544	0.000

Table (4.15) shows that when we regress internal processes integration against total sustainable development R^2 is equal to 0.588, which means that variation in internal processes integration can explain 58.8% of total sustainable development, where (R^2=0.588, F=142.544, Sig.=0.000).

Table (4.16): Results of Simple Regressions Analysis (Coefficients): Regressing Internal Processes Integration against Total Sustainable Development Dimensions.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.337	0.192		6.967	0.000
	Internal Processes Integration	0.632	0.053	0.767	11.939	0.000

Dependent Variable: Sustainable Development

Table (4.16) shows that internal processes integration has 76.7% effect on total sustainable development, where (β=0.767, t=11.939, Sig. =0.000). Therefore the null hypothesis is rejected and the alternative is accepted which states that: Internal processes' integration has an effect on sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies, at (α≤0.05).

Customer Integration:

$H_{01.3}$: Customers' integration does not have effect on sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies, at (α≤0.05).

Table (4.17): Results of Simple Regressions Analysis (ANOVA): Regressing Customer Integration against Total Sustainable Development Dimensions.

Model	R	R^2	Adjusted R^2	F	Sig.
1	0.473[a]	0.224	0.216	28.846	0.000

Table (4.17) shows that when we regress customer integration against total sustainable development R^2 is equal to 0.224, which means that variation in customer integration can explain 22.4% of total sustainable development, where (R^2=0.224, F=28.846, Sig.=0.000).

Table (4.18): Results of Simple Regressions Analysis (Coefficients): Regressing Customer Integration against Total Sustainable Development Dimensions.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.842	0.328		5.611	0.000
	Customer Integration	0.458	0.085	0.473	5.371	0.000

Dependent Variable: Sustainable Development

Table (4.18) shows that customer integration has 47.3% effect on total sustainable development, where (β=0.473, t=5.371, Sig. =0.000). Therefore the null hypothesis is rejected and the alternative is accepted which states that: Customers' integration has an effect on sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies, at (α≤0.05).

In summary, in simple regressions there was a high significant effect for supplier integration, internal processes integration and customer integration on sustainable development.

Chapter Five:
Results Discussion, Conclusions and Recommendations

5.1. Results Discussion:

Result of the current study shows that there is medium to high importance of supply chain integration of the Jordanian Phosphate Fertilizers Manufacturing Companies. The customer integration has rated the highest, followed by internal processes integration and finally supplier integration and there is medium to high importance of sustainable development dimensions of the Jordanian Phosphate Fertilizers Manufacturing Companies. The economic responsibility has rated the highest, followed by social responsibility and finally environmental responsibility.

The result shows also that the relationships among supply chain integration variables of the Jordanian Phosphate Fertilizers Manufacturing Companies are strong to very strong relationships. The relationships among sustainable development dimensions of the Jordanian Phosphate Fertilizers Manufacturing Companies variables are very strong relationships. The relationships of total sustainable development with each supply chain integration variable are strong, and the relationship between supply chain integration and sustainable development is strong.

Finally, the result shows that the supply chain integration have effect on sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies, since (R^2=61.7, F=52.734, Sig. =0.000). These results are going with line with some of previous studies, such as: Clift and Wright (2000) showed that primary resource industries give rise to environmental impacts disproportionate to the associated added value. This simple result has important implications for the positioning of companies in the supply chain, for the developing economies, and for the re-use and recycling of manufactured goods. Zhu

and Sarkis (2004) showed that two primary types of management operations philosophies, quality management and just-in-time (or lean) manufacturing principles, influence the relationship between GSCM practices and environmental and economic performance .Vachom and Mao (2008) who showed that supply chain strength is positively linked to all three dimensions of sustainable development. Yang, et. al. (2011) showed that the lean manufacturing related positively to environmental management practices and environmental management practices alone related to the market and financial performance. The current study differed with other studies such as: Titus, et. al. (2012) who showed that government support and the cost of developing and running supply chain were two factors led to disturb the implementation of supply chain management systems.

The result also shows that the internal processes integration has an effect on sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies, since (β= 0.630, t=7.243, sig. 0.000, $p<0.05$). These results are going with line with some of previous studies, such as: Zailani, et. al. (2012) showed that SSCM practices have a positive effect on sustainable supply chain performance, particularly from the economic and social perspective.

Finally, the result shows that there were no significant effects for supplier integration on sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies, since (β=0.109, t=1.167, sig. =0.000, $p>0.05$). Also the result shows that there were no significant effects for customer integration on sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies, since (β=0.142, t=1.902, sig. =0.060, $p>0.05$). These results are going with line with some of previous studies, such as: Agyei, et. al. (2013) showed that high cost of transportation arising from bad road network, limited availability of local suppliers, uncertain lead times, the communities' conflict, Government Regulations restriction, high Original Equipment Manufacturers price, Gold

price fluctuation, interest rate volatility and inaccurate order implementation. On the other hand the current study differed with other studies such as: Huo, et. al. (2005) showed the factors of the supplier integration (power and relationship commitment) and the relationship between the factors and supplier integration to enhance the organization performance. Prajogo and Olhager (2009) emphasized that logistics integration has a great effect on operations performance also the Information technology capabilities and information sharing both have significant effects on logistics integration.

5.2. Conclusions:

Based on the results that obtained through statistical analysis it has been found that the Supply Chain Integration have a significant effect on sustainable development of Jordanian Phosphate Fertilizers Manufacturing Companies. But in some of sub- variables, were not implement highly from the companies such as:

- The weakness of organize training programs jointly with its supplier, where (t= 0.457< 1.980).
- A few training sessions for the employees, where (t=1.440<1.980).
- Not all the companies support the higher education for employees and their children, where (t= 1.746< 1.980).
- The companies not provide training centers for local community members, where (t= 0.414< 1.980).
- All companies does not recycling its industrial waste of gypsum, where (t= -6.061< 1.980).
- Weakness in use eco-friendly sources of energy, where (t= 1.237< 1.980).

5.3. Recommendations:

Based on the conclusions, the researcher recommends the following:

1. Organize training programs jointly with its suppliers to reinforce the aspects of the communications.

2. Hold training sessions for the employees on continuous basis, which can increase the employee's' efficiency.

3. Advice companies to support the higher education for employees and their children.

4. The companies should participate in the social responsibility by provides training centers for local community members.

5. The companies must rethink in recycles its industrial waste of gypsum, because of their negative impact on the environment.

6. The companies must use eco-friendly sources of energy to reduce the environmental pollution.

7. The current study advices to conduct a study that will assess the effect of supply chain integration on the sustainable development in the Industry.

8. The study suggests carrying out similar research on Phosphate Fertilizer Industry in other Arab countries in order to compare the results and stand on the differences, if available, and provide the suitable interpretations.

9. Increase the variables number, which related to the supply chain integration and sustainable development.

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Appendices:

Appendix (1): Panel of Referees Committee

No.	Name	Qualification	Organization
1.	Prof. Dr. Kamil Moghrabi	Ph.D. Management	Middle East University
2.	Prof. Dr. Mohammad Al No'imi	Ph.D. Management	Middle East University
3.	Prof. Dr. Laith al-rubee	Ph.D. Management	Middle East University
4.	Prof. Dr. Waleed Al Awawdah	Ph.D. Management	Al al- bayt University
5.	Dr. Nidal Al Salehi	Ph.D. Management	Middle East University
6.	Dr. Ali Abbas	Ph.D. Management	Middle East University
7.	Dr. Ahmad Ali Saleh	Ph.D. Management	Middle East University
8.	Dr. Abdollah Al Azamat	Ph.D. Management	Al al- bayt University
9.	Dr. Ali Al Koraan	Ph.D. Management	Al al- bayt University
10.	Dr. Mohannad Nazzal	Ph.D. AIS	Al al- bayt University
11.	Dr. Haiel Al Sarhan	Ph.D. Management	Irbid National University
12.	Dr. Tawfik Mardini	Ph.D. Management	Irbid National University
13.	Dr. Mohammed Al Zoabi	Ph.D. MIS	Irbid National University
14.	Dr. Fowzi Al Taani	Ph.D. MIS	Irbid National University
15.	Dr. Saleh Al Kasasbeh	Training center manager	JPMC
16.	Eng. Anwar Al Tamimi	Production manager	IJC

Appendix (2): Jordanian Phosphate Fertilizer Manufacturing Companies (participant of the survey)

Company	Frequency	Percent	Valid Percent	Cumulative Percent
Indo Jordan Chemical (IJC)	22	21.6%	21.6%	21%
Jordanian Indian Fertilizer Company (JIFCO)	28	27.5%	27.5%	49%
Jordanian Phosphate Mines Company (JPMC)	52	51%	51%	100%
Total	**102**	**100%**	**100%**	

Appendix (3): Panel of Judges (Referees) Committee Letter (English Version)

جـــامــعــة الـــشـرق الأوسـط
MIDDLE EAST UNIVERSITY

"The Effect of Supply Chain Integration on the Sustainable Development of Jordanian Phosphate Fertilizers Manufacturing Company"

Dear Professor:

The increasingly intense competition facing business organizations globally puts greater emphasis on the supply chains due to cost limitation on what an organization wants to accomplish. Supply chain management focuses on the inflow of data, materials, services and money between the organization/customers and organization/suppliers. Undoubtedly, integration of the supply chain elements can be the cornerstone of the sustainable development process by assuming the social, economic and environmental responsibilities.

The purpose of the present MA thesis is to identify the effect of Supply Chain Integration on the Sustainable Development of Jordanian Phosphate Fertilizers Manufacturing Companies.

Please take your time to review and evaluate this questionnaire items in terms of clarity, appropriateness, belongingness, and to send back your valuable suggestions, if any, or add a comment you might consider necessary either as to this thesis or to the phosphate fertilizers manufacturing industry in general. Integrating your suggestions in the items reworded will be with gratefulness. I appreciate your valuable contribution to this study.

Thank you again for your advice and guidance, and if you have any inquiries or notice please don't hesitate to call (+9622 790586544)

Thank You

Researcher: Mahmoud Nabil Nazzal

Supervisor: Dr. Abdulaziz Al Sharbati

Appendix (4): Participants Letter (English Version)

Questionnaire

Dear Participant,

This study intends to measure **"The Effect of Supply Chain Integration on the Sustainable Development of Jordanian Phosphate Fertilizers Manufacturing Companies"**.

Please take your time to complete this questionnaire by answering all items appropriately depending on your experience. The information collected will be dealt with confidentially for scientific purpose only.

Please provide complete responses to all questionnaire items of this academic research. In case desired follow up the research, results will be available at your request. If you have any questions or inquiries, please call (0790586544)

Gratefully thank you for your contribution to this research

Researcher: Mahmoud Nabil Nazzal

Supervisor: Dr. Abdel-Aziz Ahmad Sharabati

Appendix (5): Thesis Questionnaire (English Version)

Questionnaire

Part I: Demographic Characteristics

1- Gender:	□ Male		□ Female	
2- Age:	□ 25-35	□ 36-45	□ 46-55	□ 56 or above
3- qualification:	□ Diploma	□ BA	□ MA	□ Ph.D.
4- Experience:	□ Less than 5 years	□ 5-10 years	□ 11-15 years	□ 15 or above
5-Management Level	□ Top	□ Middle	□ Operational Management	
6- Department	□ Management	□ Production	□ Quality	□ Marketing

Part II: Questionnaire Items

Please make sure answering every questions, and encircle the correct question based on your opinion based on the reality not the optimum situation of each item as follows: [1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5= Strongly Agree]

No.	Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	**2**	**3**	**4**	**5**
	Supply Chain Integration					
	Supplier Integration					
1.	The company maintains a complete profile of the suppliers	1	2	3	4	5
2.	The company sends/receives data to/from suppliers via the Internet	1	2	3	4	5
3.	The company gains best price offer for the raw-material	1	2	3	4	5
4.	The company acquires quality raw-materials as needed	1	2	3	4	5
5.	The company makes order at suppliers timely	1	2	3	4	5
6.	The company receives raw-materials just-on-time	1	2	3	4	5
7.	The company shares expertise with the suppliers	1	2	3	4	5
8.	The company organizes training programs jointly with its suppliers	1	2	3	4	5

Internal Processes Integration						
9.	There is continuous interdepartmental coordination in the company	1	2	3	4	5
10.	Interdepartmental data sharing is performed timely.	1	2	3	4	5
11.	The company applies warehousing management strategies	1	2	3	4	5
12.	The company holds training sessions for the employees on continuous basis	1	2	3	4	5
13.	The company schedules the interdepartmental production processes	1	2	3	4	5
14.	The company is careful about reducing time cycle for a process	1	2	3	4	5
15.	The company encourages boss-employee communications on continuous basis	1	2	3	4	5
16.	The company is careful about minimizing defect ratio of products	1	2	3	4	5
Customer Integration						
17.	The company has a customer database	1	2	3	4	5
18.	The company communicates with customers online	1	2	3	4	5
19.	The company delivers orders to customers timely	1	2	3	4	5
20.	The company offers quality product to the satisfaction of customers	1	2	3	4	5
21.	The company offers competitive products in terms of price	1	2	3	4	5
22.	The company provides for suitable transport means to deliver shipments to customers safely.	1	2	3	4	5
23.	The company shows interest with customer complaints and suggestions	1	2	3	4	5
24.	The company is motivated by customer satisfaction	1	2	3	4	5
Sustainable Development **Social Responsibility**						
25.	The company provides physical support to local NGOs	1	2	3	4	5
26.	The company provides health insurance plan to employees and their families	1	2	3	4	5
27.	The company provides health insurance plan for retired employees and their families	1	2	3	4	5

28.	The company applies a fair salary system	1	2	3	4	5
29.	The company supports the higher education for employees and their children	1	2	3	4	5
30.	The company provides training centers for local community members	1	2	3	4	5
31.	The company cooperates with the universities for scientific research purposes	1	2	3	4	5
32.	The company applies public safety measures for the employees	1	2	3	4	5
Economic Responsibility						
33.	The company fulfills all due tax payments	1	2	3	4	5
34.	The company contributes to an increased GDP of the Jordanian economy.	1	2	3	4	5
35.	The company contributes to reduce unemployment rate through allowing training and employment opportunities	1	2	3	4	5
36.	The company attracts foreign investments to support the national economy	1	2	3	4	5
37.	The company generates foreign currency for the country	1	2	3	4	5
38.	The company adopts best practices in exploiting the natural resources	1	2	3	4	5
39.	The company uses energy-saving strategies, and alternate power solutions	1	2	3	4	5
40.	The company diversifies its products offered in the global market	1	2	3	4	5
Environmental Responsibility						
41.	The company recycles its industrial waste of gypsum	1	2	3	4	5
42.	The company uses modern technology to reduce poisonous emissions	1	2	3	4	5
43.	The company uses eco-friendly sources of energy	1	2	3	4	5
44.	The company installs waste water treatment plant to protect against pollution of groundwater	1	2	3	4	5
45.	The company is careful about using environmentally clean trucks	1	2	3	4	5
46.	The company grows trees to increase the vegetation	1	2	3	4	5
47.	The company adheres to domestic and international regulations as to saving the environment	1	2	3	4	5
48.	The company holds training sessions for employees regarding environment issues	1	2	3	4	5

Appendix (6): Panel of Referees Committee Letter (Arabic Version)

جـــامـعــة الـــشـرق الأوسـط
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تحكيم

استبانة أثر تكامل سلسلة التوريد على التنمية المستدامة لشركات صناعة الأسمدة الفوسفاتية الأردنية

حضرة الأستاذ الفاضل:

تتزايد أهمية سلاسل التوريد مع اشتداد المنافسة عالميا، حيث أصبحت ظاهره هامة وذلك بسبب قيد التكلفة الذي يمكن من خلاله تحقيق ما ترغب المنظمة فيه. ان إدارة سلسلة التوريد تتعلق بإدارة تدفق المعلومات والمواد والخدمات والأموال بين المنظمة وعملائها وبين المنظمة والموردين. ومما لاشك فيه فان اندماج جميع أطياف هذه السلسلة يشكل اللبنة الرئيسية في تحقيق عجلة التنمية المستدامة بتحملها للمسؤوليات الاجتماعية، الاقتصادية، والبيئية.

إن غرض هذه الدراسة (رسالة ماجستير) هو معرفة أثر تكامل سلسلة التوريد على التنمية المستدامة لشركات صناعة الأسمدة الفوسفاتية الأردنية.

أرجوا من حضرتكم التكرم بتقييم فقرات هذا الاستبيان الذي ستقاس عباراته بواسطة الوضوح، الملائمة، والانتماء وبتزويدي باقتراحاتكم بشأنه، وإضافة أي تعليقات حول المواضيع التي ترونها هامة لهذه الرسالة و/أو لصناعة الاسمدة الفوسفاتية، وأَنا على أتم الاستعداد للأخذ بتوصياتكم عند إعادة كتابة وتعديل الاستبيان. وإننا نقدر اشتراككم وتوجيهاتكم لصالح هذه الدراسة.

أكرر شكري لاشتراككم وتوجيهاتكم، وإذا كان لديكم أي استفسار أو ملاحظة، الرجاء الاتصال على الرقم (00962790586544).

وشكرا لكم على اهتمامكم.

الباحث: محمود نبيل نزال

المشرف: د. عبدالعزيز الشرباتي

Appendix (7): Participants Letter (Arabic Version)

جـــامــعــة الـــشرق الأوسـط
MIDDLE EAST UNIVERSITY

استبانة لأغراض البحث العلمي

عزيزي المشارك:

تحية طيبة وبعد،،،،

تهدف هذه الدارسة إلى قياس **"أثر تكامل سلسلة التوريد على التنمية المستدامة لشركات صناعة الأسمدة الفوسفاتية الأردنية"**.

الرجاء التكرم بالإجابة على جميع الأسئلة الواردة في هذه الاستبانة بما ترونه مناسبا من خلال الخبرة التي تتمتعون بها. وإننا نعدكم بأننا سوف نستخدم هذه البيانات لأغراض البحث العلمي فقط وسنحافظ على سريتها.

ارجوأن أذكّركم بأهمية إجابتكم على جميع فقرات الاستبانة لخدمة البحث. وفي حال رغبتكم بمتابعة نتائج هذا البحث فانها ستكون متوفرة لديكم عند طلبكم لها. وإذا كان لدى حضرتكم أي استفسار أو ملاحظة، الرجاء الإتصال على الرقم (0790586544).

مع خالص الشكر والامتنان لما بذلتموه من جهد في سبيل إنجاز هذا البحث.

الباحث: محمود نبيل نزال

المشرف: د. عبدالعزيز الشرباتي

Appendix (8): Thesis Questionnaire (Arabic Version)

استبانة لقياس "أثر تكامل سلسلة التوريد على التنمية المستدامة لشركات صناعة الأسمدة الفوسفاتية الأردنية".

القسم الأول: الخصائص الديموغرافية

1- الجنس

ذكر O　　　　انثى O

2- العمر

25- 35 O　　36- 45 O　　46-55 O　　56 فما فوق O

3- المؤهل العلمي

دبلوم O　　بكالوريوس O　　ماجستير O　　دكتوراه O

4- الخبرة

أقل من 5 سنوات O　　5- 10 سنوات O　　11- 15 سنة O　　أكثر من 15 سنة O

5- المستوى الاداري

ادارة عليا O　　ادارة وسطى O　　ادارة العمليات O

6- القسم

الإدارة O　　الإنتاج O　　الجودة O　　التسويق O

القسم الثاني: أسئلة الإستبانة

(الرجاء التأكّدْ من إجابة كُلّ سؤال ووضع دائرة حول الجواب الصحيحَ استِنادًا إلى مشاعرك وأحاسيسك حول الواقع الموجود وليس بناء على الوضع المثالي لكل فقرة كالتالي: [1 = غير مطبق بقوة......، 5 = مطبق بقوة])

م	العبارات	غير مطبق بقوة	غير مطبق	محايد	مطبق	مطبق بقوة
		1	**2**	**3**	**4**	**5**
	Supply Chain Integration					
	التكامل مع المورد (Supplier Integration)					
.1	لدى الشركة معلومات كاملة عن الموردين	1	2	3	4	5
.2	تتبادل الشركة المعلومات مع المورد من خلال شبكة الانترنت	1	2	3	4	5
.3	تحصل الشركة على أفضل الأسعار للمواد الخام	1	2	3	4	5
.4	تحصل الشركة على مواد خام ذات الجودة المطلوبة	1	2	3	4	5
.5	تبعث الشركة التنبؤ بالطلب إلى الموردين بالوقت المناسب	1	2	3	4	5
.6	تستلم الشركة المواد الخام بالوقت المناسب	1	2	3	4	5
.7	تتبادل الشركة الخبرات مع الموردين	1	2	3	4	5
.8	تعمل الشركة برامج تدريبية مشتركة مع الموردين	1	2	3	4	5
	التكامل الداخلي للعمليات (Internal Processes Integration)					
.9	يوجد تنسيق مستمر بين أقسام الشركة	1	2	3	4	5
.1	يتم تبادل المعلومات بين الاقسام بالوقت المناسب	1	2	3	4	5
.1	تطبق الشركة استراتيجيات إدارة المخزون	1	2	3	4	5
.1	تقوم الشركة بعقد تدريبات مشتركة للموظفين بشكل مستمر	1	2	3	4	5
.1	تقوم الشركة بجدولة عمليات الانتاج بين الأقسام	1	2	3	4	5
.1	تسعى الشركة لتقليل الوقت اللازم لكل عملية	1	2	3	4	5
.1	تشجع الشركة التواصل المستمر بين المديرين والمرؤوسين	1	2	3	4	5
.1	تهتم الشركة بتقليل نسبة الفاقد من المنتجات	1	2	3	4	5
	التكامل مع الزبائن (Customer Integration)					
.1	تمتلك الشركة قاعدة بيانات عن الزبائن	1	2	3	4	5
.1	تتواصل الشركة مع الزبائن من خلال شبكة الانترنت	1	2	3	4	5
.1	تسلم الشركة الطلبيات للزبائن بالوقت المحدد	1	2	3	4	5
.2	توفر الشركة المنتجات للزبائن بالجودة المطلوبة	1	2	3	4	5
.2	توفر الشركة منتجاتها بأسعار منافسة	1	2	3	4	5
.2	توفر الشركة وسائط نقل مناسبة لنقل طلبيات الزبائن بسلام	1	2	3	4	5
.2	تهتم الشركة بمقترحات وشكاوي الزبائن	1	2	3	4	5
.2	تهتم الشركة برضا الزبائن	1	2	3	4	5

مطابق بقوة	مطابق	محايد	غير مطابق	غير مطابق بقوة	العبارات	م
5	**4**	**3**	**2**	**1**		
					Sustainable Development	
					المسؤولية الاجتماعية (Social Responsibility)	
5	4	3	2	1	تقدم الشركة دعم مادي لمؤسسات المجتمع المحلي	2.
5	4	3	2	1	توفر الشركة تأمين صحي للموظفين وعائلاتهم	2.
5	4	3	2	1	توفر الشركة تأمين صحي للموظفين وعائلاتهم بعد التقاعد	2.
5	4	3	2	1	تعتمد الشركة نظام عادل للأجور	2.
5	4	3	2	1	تدعم الشركة التعليم الجامعي لموظفيها وأبنائهم	2.
5	4	3	2	1	توفر الشركة مراكز تدريب لأبناء المجتمع المحلي	3.
5	4	3	2	1	تتعاون الشركة مع الجامعات لغايات البحث العلمي	3.
5	4	3	2	1	تهتم الشركة بالسلامة العامة للموظفين	3.
					المسؤولية الاقتصادية (Economic Responsibility)	
5	4	3	2	1	تقوم الشركة بتسديد جميع الضرائب التي عليها	3.
5	4	3	2	1	تسهم الشركة بزيادة الناتج المحلي للاقتصاد الأردني	3.
5	4	3	2	1	تساعد الشركة في تخفيف البطالة عن طريق تدريب وتشغيل العاملين	3.
5	4	3	2	1	تستقطب الشركة الاستثمارات الاجنبية التي تدعم الاقتصاد المحلي	3.
5	4	3	2	1	تجلب الشركة العملة الأجنبية للدولة	3.
5	4	3	2	1	تستغل الشركة الموارد الطبيعية بطرق مثلى	3.
5	4	3	2	1	توفر الشركة من استهلاك الطاقة وتستخدم طرق بديلة للطاقة	3.
5	4	3	2	1	تقوم الشركة بطرح منتجات متنوعة في السوق العالمي	4.
					المسؤولية البيئية (Environmental Responsibility)	
5	4	3	2	1	تقوم الشركة بإعادة تدوير مخلفاتها الصناعية (الجبس)	4.
5	4	3	2	1	تستخدم الشركة معدات حديثة لتقليل انبعاث الغازات السامة	4.
5	4	3	2	1	تستخدم الشركة مصادر طاقة صديقة للبيئة	4.
5	4	3	2	1	تقوم الشركة بمعالجة مياه مخلفاتها الصناعية لحماية المياه الجوفية من التلوث	4.
5	4	3	2	1	تحرص الشركة على استخدام ناقلات غير ملوثة للبيئة	4.
5	4	3	2	1	تقوم الشركة بزرع الأشجار والمساهمة بالتخضير	4.
5	4	3	2	1	تلتزم الشركة بالقوانين المحلية والعالمية بخصوص المحافظة على البيئة	4.
5	4	3	2	1	تقوم الشركة بعقد دورات تدريبية لموظفيها حول المحافظة على البيئة	4.

Appendix (9): Statistical Analysis

Frequency Table

Comp

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	JIC	22	21.6	21.6	21.6
	JIFCO	28	27.5	27.5	49.0
	JPMC	52	51.0	51.0	100.0
	Total	102	100.0	100.0	

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	93	91.2	91.2	91.2
	2	9	8.8	8.8	100.0
	Total	102	100.0	100.0	

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	30	29.4	29.4	29.4
	2	28	27.5	27.5	56.9
	3	35	34.3	34.3	91.2
	4	9	8.8	8.8	100.0
	Total	102	100.0	100.0	

Qual

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	13	12.7	12.7	12.7
	2	69	67.6	67.6	80.4
	3	16	15.7	15.7	96.1
	4	4	3.9	3.9	100.0
	Total	102	100.0	100.0	

Exp

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	11	10.8	10.8	10.8
	2	21	20.6	20.6	31.4
	3	4	3.9	3.9	35.3
	4	66	64.7	64.7	100.0
	Total	102	100.0	100.0	

Pos

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	21	20.6	20.6	20.6
	2	62	60.8	60.8	81.4
	3	19	18.6	18.6	100.0
	Total	102	100.0	100.0	

Dep

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	56	54.9	54.9	54.9
	2	21	20.6	20.6	75.5
	3	11	10.8	10.8	86.3
	4	14	13.7	13.7	100.0
	Total	102	100.0	100.0	

Normality:

One-Sample Kolmogorov-Smirnov Test

	SI	II	CI	SR	ECR	ENR	SCI	SD
Kolmogorov-Smirnov Z	.770	1.286	.950	1.541	1.040	.665	.875	.656
Asymp. Sig. (2-tailed)	.594	.073	.328	.017	.230	.769	.428	.783

RELIABILITY

RELIABILITY VARIABLES=SI1 SI2 SI3 SI4 SI5 SI6 SI7 SI8

Reliability Statistics

Cronbach's Alpha	N of Items
.811	8

RELIABILITY VARIABLES=II1 II2 II3 II4 II5 II6 II7 II8

Reliability Statistics

Cronbach's Alpha	N of Items
.891	8

RELIABILITY VARIABLES=CI1 CI2 CI3 CI4 CI5 CI6 CI7 CI8

Reliability Statistics

Cronbach's Alpha	N of Items
.873	8

RELIABILITY VARIABLES=SR1 SR2 SR3 SR4 SR5 SR6 SR7 SR8

Reliability Statistics

Cronbach's Alpha	N of Items
.881	8

RELIABILITY VARIABLES=ECR1 ECR2 ECR3 ECR4 ECR5 ECR6 ECR7 ECR8

Reliability Statistics

Cronbach's Alpha	N of Items
.807	8

RELIABILITY VARIABLES=ENR1 ENR2 ENR3 ENR4 ENR5 ENR6 ENR7 ENR8

Reliability Statistics

Cronbach's Alpha	N of Items
.843	8

RELIABILITY VARIABLES=SI II CI

.**Reliability Statistics**

Cronbach's Alpha	N of Items
.785	3

RELIABILITY VARIABLES=SR ECR ENR

Reliability Statistics

Cronbach's Alpha	N of Items
.794	3

T-TEST

VARIABLES=SI1 SI2 SI3 SI4 SI5 SI6 SI7 SI8 II1 II2 II3 II4 II5 II6 II7 II8 CI1 CI2 CI3 CI4 CI5 CI6 CI7 CI8 SR1 SR2 SR3 SR4 SR5 SR6 SR7 SR8 ECR1 ECR2 ECR3 ECR4 ECR5 ECR6 ECR7 ECR8 ENR1 ENR2 ENR3 ENR4 ENR5 ENR6 ENR7 ENR8 SI II CI SR ECR ENR SCI SD

/CRITERIA=CI(.95).

	Mean	Std. Deviation	t	Importance	Ranking
SI1	3.85	.813	10.593		
SI2	3.84	.887	9.598		
SI3	3.48	.952	5.098		
SI4	3.29	.907	3.273		
SI5	3.72	.837	8.636		
SI6	3.46	.829	5.616		
SI7	3.39	.914	4.335		
SI8	3.05	1.084	.457		
II1	3.71	.874	8.156		
II2	3.69	.867	7.992		
II3	3.74	.855	8.684		
II4	3.18	1.238	1.440		
II5	3.67	.812	8.287		
II6	3.56	.907	6.220		

II7	3.43	1.039	4.193		
II8	3.48	.909	5.337		
CI1	3.77	.932	8.389		
CI2	3.78	.779	10.171		
CI3	3.80	.809	10.038		
CI4	3.87	.792	11.128		
CI5	3.75	.841	8.952		
CI6	3.60	1.007	5.995		
CI7	3.80	.718	11.307		
CI8	4.02	.758	13.593		
SR1	3.61	1.016	6.041		
SR2	4.26	.703	18.180		
SR3	3.60	1.074	5.623		
SR4	3.17	1.091	1.543		
SR5	3.22	1.248	1.746		
SR6	3.05	1.197	.414		
SR7	3.24	1.179	2.016		
SR8	4.06	.854	12.523		
ECR1	4.17	.719	16.395		
ECR2	4.24	.720	17.328		
ECR3	4.00	.704	14.354		
ECR4	3.74	1.014	7.323		
ECR5	4.02	.744	13.834		
ECR6	3.71	.950	7.503		
ECR7	3.78	.991	7.991		
ECR8	3.39	1.091	3.629		
ENR1	2.32	1.127	-6.061		
ENR2	3.48	.982	4.939		
ENR3	3.13	1.040	1.237		
ENR4	3.37	1.143	3.293		
ENR5	3.39	1.036	3.825		
ENR6	4.05	.750	14.133		
ENR7	3.81	.909	9.041		
ENR8	3.20	1.282	1.544		
SI	3.51103	.594972	8.675		
II	3.55515	.712680	7.867		
CI	3.80025	.606600	13.324		
SR	3.52451	.782908	6.766		
ECR	3.87990	.573745	15.489		
ENR	3.34436	.721067	4.823		
SCI	3.622141	.5354030	11.736		
SD	3.582925	.5874002	10.023		

CORRELATIONS
/VARIABLES=SI II CI SR ECR ENR SCI SD

Correlations

		SI	II	CI	SR	ECR	ENR	SCI	SD
SI	Pearson Correlation	1	.692**	.538**	.557**	.541**	.482**	.881**	.621**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000
	N	102	102	102	102	102	102	102	102
II	Pearson Correlation	.692**	1	.433**	.662**	.576**	.697**	.864**	.767**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000
	N	102	102	102	102	102	102	102	102
CI	Pearson Correlation	.538**	.433**	1	.408**	.502**	.313**	.769**	.473**
	Sig. (2-tailed)	.000	.000		.000	.000	.001	.000	.000
	N	102	102	102	102	102	102	102	102
SR	Pearson Correlation	.557**	.662**	.408**	1	.607**	.585**	.654**	.881**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000
	N	102	102	102	102	102	102	102	102
ECR	Pearson Correlation	.541**	.576**	.502**	.607**	1	.529**	.646**	.812**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000
	N	102	102	102	102	102	102	102	102
ENR	Pearson Correlation	.482**	.697**	.313**	.585**	.529**	1	.606**	.841**
	Sig. (2-tailed)	.000	.000	.001	.000	.000		.000	.000
	N	102	102	102	102	102	102	102	102
SCI	Pearson Correlation	.881**	.864**	.769**	.654**	.646**	.606**	1	.749**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000
	N	102	102	102	102	102	102	102	102
SD	Pearson Correlation	.621**	.767**	.473**	.881**	.812**	.841**	.749**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	
	N	102	102	102	102	102	102	102	102

**. Correlation is significant at the 0.01 level (2-tailed).

REGRESSION

STATISTICS COEFF OUTS R ANOVA
CRITERIA=PIN(.05) POUT(.10)
DEPENDENT SD
METHOD=ENTER SI II CI.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.786[a]	.617	.606	.3688116	1.558

a. Predictors: (Constant), CI, II, SI
b. Dependent Variable: SD

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.519	3	7.173	52.734	.000[b]
	Residual	13.330	98	.136		
	Total	34.849	101			

a. Dependent Variable: SD
b. Predictors: (Constant), CI, II, SI

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constan)	.839	.260		3.231	.002		
	SI	.107	.092	.109	1.167	.246	.451	2.217
	II	.519	.072	.630	7.243	.000	.516	1.939
	CI	.137	.072	.142	1.902	.060	.703	1.422

a. Dependent Variable: SD

Simple Regression:
Supplier Integration:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.621[a]	.386	.379	.4627472

a. Predictors: (Constant), SI

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.435	1	13.435	62.743	.000[b]
	Residual	21.413	100	.214		
	Total	34.849	101			

a. Dependent Variable: SD
b. Predictors: (Constant), SI

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.431	.276		5.192	.000
	SI	.613	.077	.621	7.921	.000

a. Dependent Variable: SD

Internal Integration:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.767[a]	.588	.584	.3790524

a. Predictors: (Constant), II

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.481	1	20.481	142.544	.000[b]
	Residual	14.368	100	.144		
	Total	34.849	101			

a. Dependent Variable: SD
b. Predictors: (Constant), II

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.337	.192		6.967	.000
	II	.632	.053	.767	11.939	.000

a. Dependent Variable: SD

Customer Integration:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.473[a]	.224	.216	.5200665

a. Predictors: (Constant), CI

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.802	1	7.802	28.846	.000[b]
	Residual	27.047	100	.270		
	Total	34.849	101			

a. Dependent Variable: SD
b. Predictors: (Constant), CI

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.842	.328		5.611	.000
	CI	.458	.085	.473	5.371	.000

a. Dependent Variable: SD